THE IRON AGE

A Review of the Hardware, Iron, Machinery and Meta... ...es.

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New York, Thursday, October 19, 1905.

The Leavitt Peat Machine.

There are two processes of preparing crude peat for the market, one by condensing and one by pressure. Experts generally consider the first preferable. Peat has a peculiar affinity for water, and neither centrifugal force nor direct pressure can successfully remove the water which it contains as it comes from the bogs. On the other hand, after peat has been treated by the condensing process it may be spread out in the open air and will give up its water by evaporation, while it will not to any extent absorb moisture such as rain or dew. Crude peat will burn, and is so used, especially in Ireland, but it is vastly inferior to the prepared article, which after a time becomes mineral like in its characteristics.

The machine shown in the accompanying illustrations is designed to prepare crude peat by condensing for the evaporating treatment. It was built by the Moore & Wyman Elevator & Machine Company, South Boston, Mass., for T. H. Leavitt, the inventor, who has been interested in peat manufacture since 1865. This machine is the result of experiments and the successful operation of a number of peat machines in which the same general principles have been carried out.

The purpose of the machine is to destroy the original physical organization and cellular structure of the peat; to eject the air, a great quantity of which is contained in the cells, and by its presence causes air holes in the prepared fuel; to develop the plastic and adhesive properties of the peat, finally condensing the mass in its moist condition into a fine grained felt-like substance which is automatically formed and delivered in brick-like blocks. These blocks, as first molded, are about 4 x 8 x 2½ inches. The capacity of the machine is 65,000 blocks, or about 113 tons per ten-hour day, which after drying make some 40 tons of hard, dry fuel. This capacity can be readily increased 25 or 50 per cent.

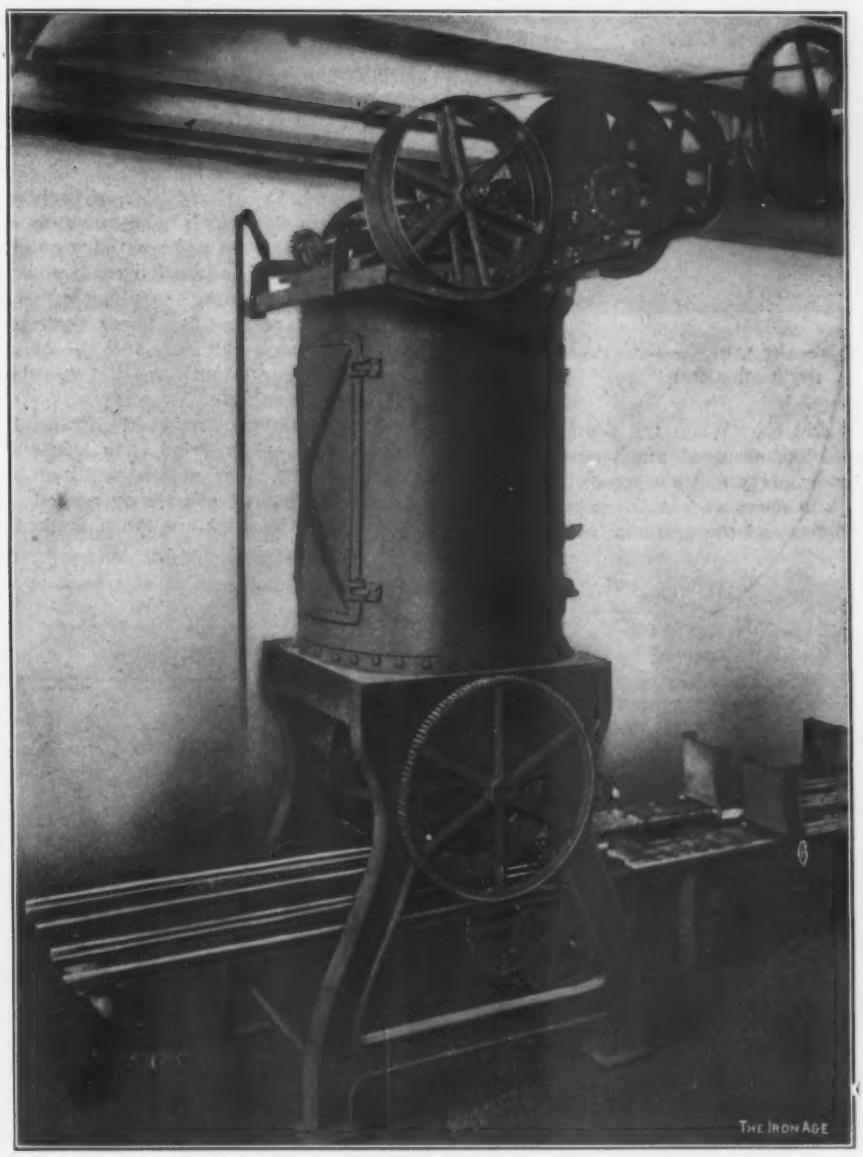


Fig. 1.—The Molding Mill, in which the Prepared Peat is Formed into Blocks.

The machine may be considered in two parts, the condenser proper and the molding mill, though the latter also plays some part in the condensing. Fig. 1 shows the molding mill, Fig. 2 the condenser and Fig. 3 a line elevation of a complete equipment. The raw peat is fed into the hopper of the condenser at A, Fig. 3, and is cut up by the ripper B, which has flanges 2 inches wide, resembling the blades of a screw propeller, and is carried on a 1½-inch shaft. From the ripper the peat enters a series of three pairs of cast iron rolls, each 3 feet long, the lower roll of the first pair being heavily corrugated

to assist in the delivery of the material. These rolls perform a rubbing process, which is brought about by the difference in speed of each roll of each pair. The upper roll of the first pair makes 40 revolutions to 20 of the lower; the ratio of the second pair is 90 and 40, and of

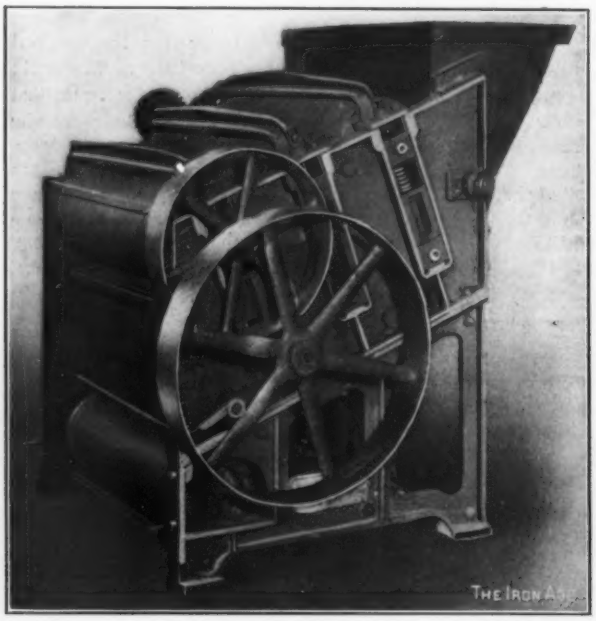


Fig. 2.—The Condenser, which Prepares the Crude Peat for the Molding Mill.

the third pair 180 and 60. When the peat has passed through the rolls it has assumed much of the desired plastic and adhesive property and has somewhat the consistency of putty. The fibers and small roots have been desiccated by the ripper and the granular form has been made into a wet, pasty mass, for peat contains when in the best general condition for this treatment on an average 60 per cent. of water, and comparatively little of it has been removed in squeezing between the rolls. The air, however, has been removed, and the bulk of the mass has been reduced 30 to 50 per cent. The rolls are adjustable by screws and are very strong, so that the presence of a stone too large to pass between them will do no damage other than to cause the belt to slip. Stones are, however, rarely met in peat, their presence being due rather to accident.

From the last pair of rolls the peat falls on a belt conveyor, inclosed in a wooden casing, and is carried to the hopper of the molding machine at C. In this machine is a series of slotted shelves, D, each shelf filling one-half of the area of the mill. The shelves are arranged alternately on opposite sides of the center. The slots radiate from the center and are ½ inch wide. On a central vertical shaft are keyed the sweeps E, each having two arms and three single arm sweeps F, the function of the latter being to press the peat down into the pockets of the revolving molds. The sweeps just clear the shelves as they revolve, thus continuing the process of rubbing the peat, some of which is pressed down through the slots, but much the greater part falls from one shelf to the other. The distance between the sweep and its shelf is not arbitrary. The sweeps may be adjusted to suit the requirements of the peat, which varies greatly in different bogs and in different sections of the world.

The two revolving cylinders G containing the molds are similar to those used in brick making machinery. Each pocket has its plunger, H, the shank of which carries a stud, I. At each side of each cylinder is a plate with a cam slot which holds the ends of the studs. The cam motion is such as to withdraw the plunger as it approaches the upper position ready to take the peat from the mill and to force the plunger forward, ejecting the block as it reaches its lower position. There are 18 pockets in each cylinder, and the cylinders make three revolutions per minute, so that together they discharge 108 blocks a minute.

This particular machine is arranged to drop the peat bricks on boards carried on a continuous belt which is provided with dogs at the required intervals so as to deliver the boards exactly as needed. The boards each hold six bricks, and are taken from a magazine shown at U, from which one falls as rapidly as that beneath it is removed. This arrangement is not standard. A belt conveyor to take the peat bricks to the drying ground may be employed. Similar mechanism may be used to deliver the peat to the hopper of the condenser. Circumstances would govern this practice.

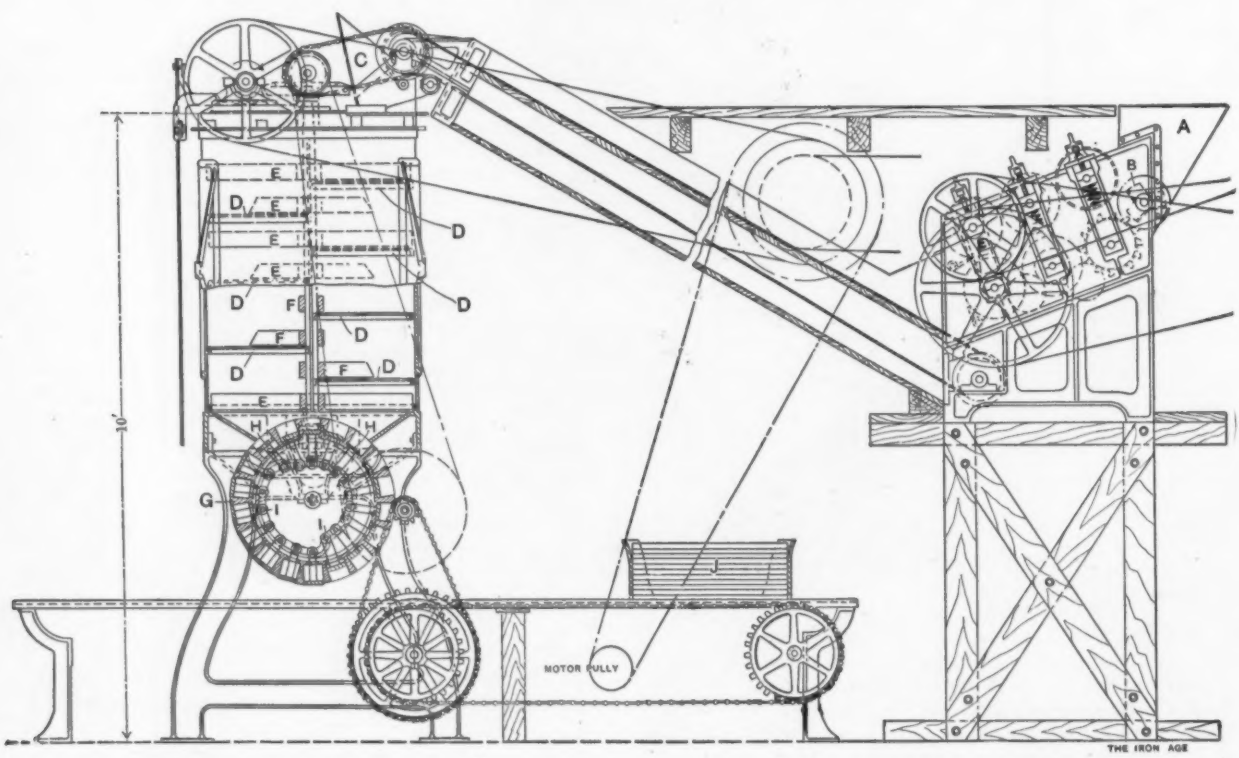


Fig. 3.—A Complete Plant, comprising the Condenser, Molding Mill and Auxiliary Apparatus.

The blocks, as taken from the machine on the boards, are removed to the spreading ground or stacked on racks and left to dry in the open air. If required the drying may be facilitated by artificial means, such as a blast of hot air from a blower. No pressure is applied at any stage of the manufacture. The blocks ordinarily weigh about 3½ pounds, contain 80 cubic inches, and present a surface for drying of 124 square inches. Evaporation goes on rapidly, the particles of peat contract with and about each other and the mass gradually assumes mineral characteristics until perfectly dry, when it is as hard as stone, is impervious to water and cannot again be restored to its original soft condition. The fuel is in condition to be housed or sold in from four days to two weeks, according to the weather. Provision is made for heating the peat while it passes through the mill, which hastens the drying process. When it is desired an injector is attached whereby coal dust, saw dust, oil, rosin, tar, bitumen, crushed ores or other substances may be introduced and mingled with the peat.

The mill entire occupies a floor space of about 5 x 20 feet, is 10 feet high, weighs about 9000 pounds and requires about 10 horse-power for its operation.

One mill has been in very successful operation since the first of last May at the works of the Orlando (Florida) Water & Light Company, making the entire fuel supply for the plant, which has a capacity of 500 horse-power. At present the rate of fuel production is that given previously, but the speed is to be increased 25 per cent., so that the mill will deliver 81,000 blocks, or about 141 tons, per day of ten hours. This is entirely possible, for when the machine was being tested before shipment it was run at a rate as high as 400 tons per day and did perfect work. In actual service, however, the latter speed is not practicable for it yields a product far beyond the ability of the men to handle. The fuel produced at the Florida plant is being made for less than the cost of coal or wood. A ton of it exceeds in heating value a cord of wood, costing there about $3.15, or a ton of coal, costing $5. As yet the fuel benefit of the peat is not being realized, as it will be when the furnaces are better arranged and the men have become accustomed to the new fuel.

The Use of Soft Coal in New York City.

BY FREDERICK E. SAWARD.

The quantity of soft coal used in New York City is very evidently a growing one, as every person familiar with the city must be only too well aware. Its use has increased very materially since the period of stress for fuel during the anthracite coal strike of 1902. Many of the users of this grade of fuel are doing their best not to make its use a nuisance; the Health Department only takes cognizance of the use of the fuel when it is a nuisance, under the penal code, which in effect means that no one must do anything that will be an annoyance —perhaps that is the better word—to his neighbors. In many places in the city the use of soft coal is effected so that one cannot say that any ill occurs, and then again there are places where it is only too evident that some one is burning soft coal without any regard for the wants, inclinations, wishes or comfort of those in the vicinity. The very cheapness of this fuel during the past summer has been the main thing which attracted many people to its use; then there are the ease and quickness with which steam can be raised by it, and this is a most important point.

It is said on pretty good authority that 3,000,000 gross tons of soft coal are used here on shore alone in the course of a year, but this does not by any means represent the fullness of this utilization of soft coal, for there are the adjacent cities and the steamships and tugboats on the rivers that add to the volume. The turnout of smoke such as one may see from the windows of our tall buildings only too well tells the tale. In the bright days of summer it is not so noticeable perhaps, but along about this time of the year and from now forward there will be many evidences by the dust and dirt which accumulate on one's desk and papers. The use of furnaces such as those in the Federal Building tends to the elimination of smoke to the extent of its being a nuisance, and it is surprising that more establishments do not adopt some system of burning soft coal so that they are not nuisances. There is the best evidence that it can be done, and as the winter advances and more steam heat is needed it is surely to be hoped that an effort will be made along proper lines. People from the West tell us that we have an ideal city, because there is nothing like the smoke, soot and dirt that there is elsewhere. We want it to continue to be cleanly, but, as stated above, there is a growth in the use of soft coal that makes one fear that the worst is upon us. In view of all that has been said, it is only too important to note that much of this dirt and dust does not originate in the city, for there is constantly a great quantity of soft coal smoke emitted from craft on the rivers, which is carried over the entire length and breadth of Manhattan Island by the wind. The volume borne on a westerly wind is especially large, for a considerable tonnage of soft coal is consumed by the factories and steam using plants of various kinds located on the New Jersey shore opposite New York, as well as by the railroads having their terminal yards across the North River. In fact, the whole waterfront is often beclouded by dark gray smoke. The nuisance created by the oil refineries on the east side of the East River is too generally known to require comment, and the Williamsburg sugar refineries are also conspicuous offenders. In addition to this every large power plant in the greater city is incessantly producing more or less smoke, even where hard coal is used. In order to burn successfully the smaller sizes of anthracite a forced draft is essential in most cases, and this causes a heavy discharge of fine ash and soot from the smoke-stacks or chimneys, which is nearly as objectionable as soft coal smoke.

Everybody, it is safe to say, concedes the smoky chimney to be a nuisance. But the view is a passive one. Formerly, and to some extent even to-day, the argument was: "We can't stop our chimney from smoking." Technical advance and commercial development have made combustion a more manageable procedure, and to-day the old argument is replaced by: "What are you going to do about it? You can't expect me to spend a lot of money putting in fancy devices to prevent smoke." The latter argument can be met only by fact—the fact that the law says one must prevent smoke being put forth in sufficient volume to be a nuisance. When this is so, the authorities can take the offender before the court and a fine will be imposed. With some folks it is cheaper to pay an occasional fine than to remedy the evil.

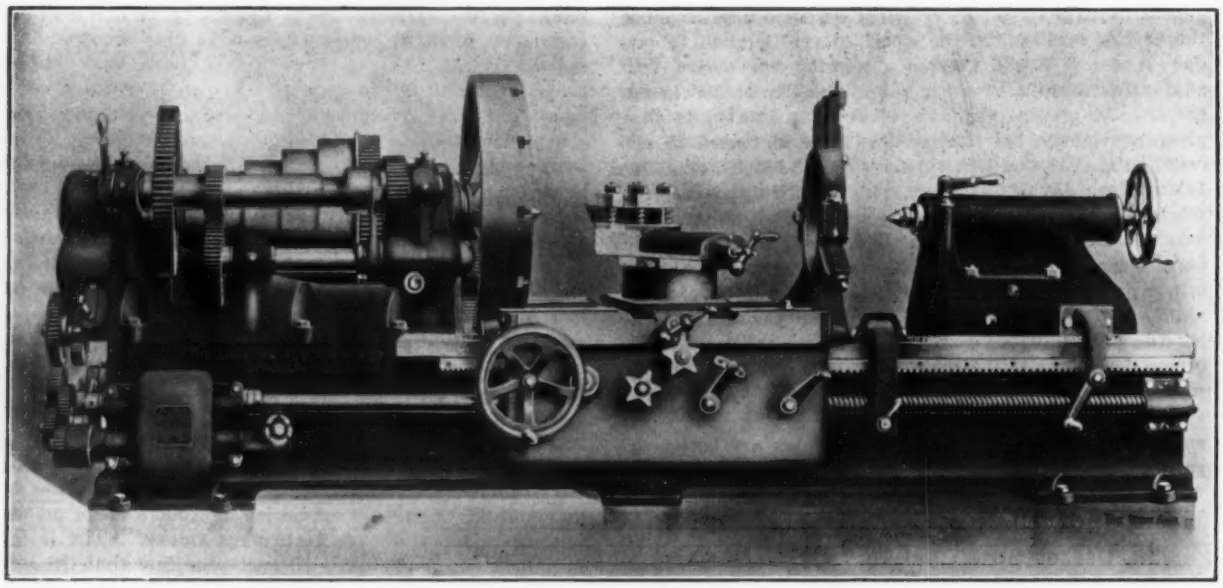
At a congress of mine owners and ironmasters recently held at Kristinehamn, Sweden, the question was discussed, "Why has Sweden to export her ore to foreign countries, instead of smelting it herself?" Absence of suitable fuel was the gist of the reply. It was pointed out that while Sweden has an almost unlimited supply of wood means of transportation from the provinces to the mining districts in which it is to be used are poor. The fact that there is no standard gauge on the railroads adds to the difficulty, causing great waste of labor. There was some discussion of the use of peat as a fuel for furnaces. In Sweden there are vast areas of peat moors, but the peat is said to be too spongy in its raw form to produce the necessary heat. Experiments are now being made at Storfors to devise means by which the water can be extracted and the peat compressed into briquettes, the natural oil being carefully retained. These experiments are said to be satisfactory.

The report that the Pennsylvania Railroad Company had placed an order for 1500 steel passenger cars with the Pressed Steel Car Company, Pittsburgh, is officially denied. The report probably arose from the fact that the Pennsylvania Railroad has decided to build at the Altoona shops three experimental steel cars consisting of a postal, a baggage and a passenger car. After these cars have been built and tested for a few months the matter of a large order for steel passenger cars will then be taken up.

New Heavy American Engine Lathes.

An improved quick change gear mechanism is one of the special features of a new line of heavy lathes built by the American Tool Works Company, Cincinnati, Ohio. The lathes are designed to meet the greatly increased duties imposed by the use of special high speed steel tools and, due to their construction and new features, are claimed to be exceptionally rapid work producers.

The change gear mechanism provides 32 changes for feeding and thread cutting, the range of threads being from 1 thread in 4 inches to 16 threads per inch, including 11½-inch with pipe thread. The feeding range is 6.4 to 92 cuts per inch. A change may be effected, even while running, by revolving the nut at the right of the gear box beneath the head, which moves a sliding key, engaging two opposed gears, each being one of a cone of gears contained in the gear box. The feed or screw pitches thus obtained are multiplied through the compound gears on the quadrant for each additional thread. This arrangement gives flexibility to the screw cutting mechanism, making it possible, through the introduction of certain gears, to cut practically an unlimited range of special worms, or threads, either finer or coarser than the range indicated above. Index plates show how to obtain any thread or feed.



A 42-Inch Engine Lathe with Triple-Geared Head, Built by the American Tool Works Company, Cincinnati, Ohio.

The bed is of deep section, very heavy and of patent drop V pattern, which gives 2 inches additional swing. It has cross box girders at short intervals its entire length, giving great rigidity. The bed is further strengthened by a rack cast in the center, for engaging the pawl of the tail stock. The head stock is also very heavy and is firmly bolted to the bed. It has triple gears and a five-step cone, the largest diameter being 20 inches, and the face of each step is 4¾ inches wide. The spindle is of high carbon steel, accurately ground, and has a 2⅝-inch hole through it. The bearings are of phosphor bronze, with improved oiling facilities and means for any necessary adjustments. The triple gears are of the slip gear type and are engaged by a rack and pinion at the front of the head. The internal gear is integral with the face plate, and the pinion is in one piece with its shaft. All gears are of coarse pitch and wide face. Fifteen speeds are obtained in geometrical progression. The ratio of the reduction through the gearing is high, to give heavy cutting power.

The tail stock has large continuous bearings on the ways, and is moved rapidly along the bed by a crank and gear engaging a rack on the bed. It is provided with means for setting over to turn tapers. The base is clamped to the bed, and is further secured against movement by a pawl engaging the cast rack in the center of the bed. The spindle has a very long travel and is actuated by a hand wheel and screw. The carriage is very heavy, especially in the bridge, which is possible with the drop V bed, has a continuous bearing of 50 inches on the ways and is gibbed to bed its entire length. The apron extends the entire length of the carriage and is tongued and grooved and bolted to it. It is double, giving all shafts a double bearing. Both the longitudinal and cross feeds are reversible through a tumbler plate operated from the front of the apron, and not at the head stock, as on most lathes. This feature is of special value on lathes having long beds. The half nuts are also controlled by a lever on the front of the apron. All the gears and pinions in the apron are steel, of wide face and coarse pitch. Those that run loose have bronze bushings. The bevel pinion is never disengaged, hence is not apt to be broken. Convenient means for thorough lubrication are provided from the front.

The compound rest is fitted with taper gibs in such a manner that no amount of strain will disturb them. The top slide is provided with power angular cross feed, with 13½-inch travel. The swivel is graduated and the top slide and cross feed screws have micrometer dials. The regular equipment includes steady, follow and full swing rests, countershafts and wrenches. When specified the lathe is equipped with an improved taper attachment, all gear head stock, electric motor and double or triple friction countershaft.

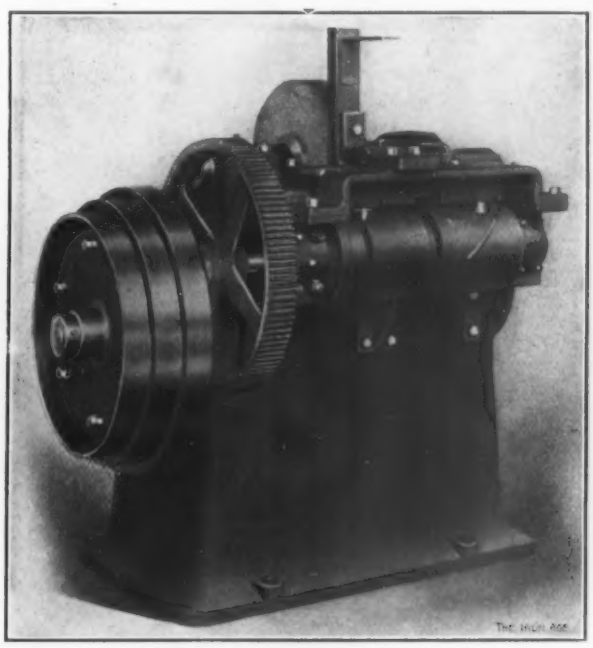
A new method of obtaining oxygen was described in a recent address by Prof. F. Linde before the Technical Society of Frankfort, Germany. It is found that liquid air when evaporated slowly loses nitrogen more readily than it does oxygen. After the process has continued for some time, therefore, the resulting liquid will be much richer in oxygen than at first. By repeating the process a liquid is finally obtained which contains about 71 per cent. of oxygen and 29 of nitrogen. A further increase in the percentage of oxygen is obtained by rectification. The cost of production of oxygen by this process is less than 1 cent per cubic yard.

In the Leitner-Lucas system of train lighting as now employed on a number of European roads the voltage of the generator is kept constant, independent of the speed of the train, by a small exciter mounted on the dynamo shaft, supplying current to a set of demagnetizing coils on the main dynamo field. In a newer design this demagnetization is brought about by a second pair of brushes on the main dynamo, placed at right angles to the main brushes. Each of these secondary brushes forms a pair with one of the primary brushes and supplies current to the demagnetizing coils, thus doing away with the exciter.

An Automatic Sprue Grinder.

The purpose of the machine herewith illustrated, made by the Automatic Machine Company, Bridgeport, Conn., is the removing of sprues from cast iron nuts or similar small castings. In any kind of grinding machinery a common trouble is the rapid destruction of the rubbing surfaces due to the presence of dust or detached particles from the grinding wheels. This annoyance in the sprue grinder has been overcome by using bushings in the bearings and detachable surfaces on the slides, which are easily and inexpensively replaced when worn out.

The grinding wheel is of ordinary pattern and is mounted in stationary bearings. The special features are all to be found in the mechanism for feeding the work to the wheel. Two slides, operating on the same ways, hold the nut to be ground, and pass it across the face of the wheel. The slides are actuated by two cylindrical cams on the gear driven cam shaft on the front of the machine. The work is fed through a chute which is filled from a table that rests upon the bracket shown on the side of the chute. The nuts drop by gravity upon a table one at a time and the slide nearest the



A Sprue Grinding Machine, Made by the Automatic Machine Company, Bridgeport, Conn.

large gear carries the nut from the table to a position where the two slides, acting as vise jaws, grip it. The jaw on the second slide is backed with a heavy spring which gives a yielding grip to accommodate variations in the size of the work. After the nut has been ground it is removed by a stripper finger which holds it while the slides open, and it is then allowed to drop through an opening in the table into a box beneath.

The drive of the feeding mechanism is arranged to slip when a predetermined amount of resistance is encountered, to prevent injury to the machine from the jamming of a piece of work against the wheel, or in the slides or conveying mechanism. If a nut blank should have a sprue of unusual size or hardness the regular rate of feed would be too rapid. The work must therefore be presented to the wheel as carefully as it would be by hand, which requires an automatic sensitiveness. This is afforded by a friction drive from the cone pulley. The driving pinion, which meshes with the driven gear on the cam shaft, is in one piece with a friction flange, both being mounted on a sleeve which revolves on a stud. The cone pulley is loose upon this sleeve and carries on its inner hub a friction plate. The friction flange is between the inner face of the pulley and the friction plate, and is separated from them by fiber disks. The friction plate and pulley are clamped together by bolts under spring tension. The tension is adjusted so that the normal amount of power is transmitted to drive the nut across the wheel. When unusual conditions arise and the pressure of the work against the wheel becomes excessive the friction drive slips, causing the slide to hesitate, enabling the wheel to free itself by cutting. This relieves the strain and the friction drive again takes hold, feeding the work at the required rate.

The Illinois Steel Company Improves Its Ore Handling Equipment.

At a cost of $1,500,000 the Illinois Steel Company, Chicago, Ill., is equipping its ore dock on the south channel of its South Chicago Works with the Hoover & Mason ore handling system, and two bridges of the Hoover & Mason type are being added to the equipment of the dock on the north channel. For more than five years the Hoover & Mason system has been in operation on the north dock and at furnaces 9 and 10, and the results have been so satisfactory that it was decided to extend the equipment to cover both docks. The vessels are unloaded at the north dock by means of a battery of 15 unloaders operated by steam, and the general improvement scheme includes the operation of these unloaders by electric power.

At the time of the first installation on the north dock two bridges, each 520 feet long, were installed. Two additional bridges have been added of the same length and general dimensions. As soon as these bridges can be placed in operation the other bridges that are not of the Hoover & Mason type will be discarded. When the equipment on the north dock is complete it will include four bridges and 15 unloaders. On the south dock the equipment will include two bridges and seven unloaders. The present ore handling equipment on the south dock is of an antiquated type, and the installation of this equipment will greatly facilitate and lessen the cost of unloading and handling the ore for the four blast furnaces located at this point. Foundations have already been laid for the erection of a fifth stack in this group. When the installation of the new plant is completed it is the intention to unload vessels at night as well as day, and the time for unloading at both docks with the new and added equipment will be greatly reduced. A description of the Hoover & Mason ore handling equipment on the north dock was given in *The Iron Age* of September 4, 1902.

The Minette District in France.

The recent development of the steel industry of France, followed by the appearance of some of the leading works as sellers in the international markets, is coincident with the rapid opening up of the Minette district along the borders of Luxemburg and Lorraine. A recent report by H. Cousin, published by the Comité des Forges de France, presents some interesting figures which deal with the output of the Department of Meurthe-et-Moselle in 1904. The iron mines may be divided into two groups, that of the basin of Nancy and that of the basin of Briey and Longwy. In 1904 the mines in the Nancy district produced 1,711,770 metric tons, as compared with 1,668,533 tons in 1903. It is not expected that an important increase will take place in the future. It is in the Longwy section, with its outcrop mines, and in the Briey section, with its deep mines, that a further rapid growth is looked forward to. In 1904 the production of the Longwy-Briey basin was 3,821,437 tons, an increase of 588,306 tons over 1903. Adding the output of the quarries, the production of iron ore for the Department of Meurthe-et-Moselle was 5,951,274 tons, an increase over 1903 of 658,931 tons. The shipments to other departments in France and to Belgium, Luxemburg and Germany amounted to 1,043,000 tons. The average value at the mines was 3.51 francs per ton. The total number of men employed was 6075, to whom wages aggregating 8,877,275 francs were paid. In the Longwy-Briey basin miners average 6 to 7 francs per day, but many of them earn more than 10 francs, or $2, per day. Cutting machinery is being employed, Morgan Gardner chain machines being in use at the Maron-Val-de-Fer and the Mont-Saint-Martin mines. They are electrically driven.

The New England Foundrymen's Association.

This association paid a visit to the new plant of the United Shoe Machinery Company, Beverly, Mass., as a preliminary to its regular meeting October 11. It was an unusually interesting afternoon, for the plant possesses some novel features. The foundry was the center of interest, of course, but the great works was gone over with much closeness of inspection, including the power plant, where the Curtis steam turbines came in for particular attention. This plant is built entirely of reinforced concrete, even to the chimneys of the power house, and this alone was of engrossing interest, for there probably exists no better specimen of this form of construction. The 50 members of the party returned to Boston in the late afternoon and gathered for dinner at the Exchange Club. After dinner routine business was transacted, with President John Magee in the chair, and the members then listened to a talk by Leonard C. Wason, president of the Albertson Construction Company, on "Different Types of Construction for Foundries," which was a most timely topic after the afternoon's experience, and this was made the more true by the use of a stereopticon. Frank W. Reynolds of Lockwood, Greene & Co., Boston, made remarks on the same general topic. The committee appointed to prepare resolutions on the death of Alva Carpenter of the A. Carpenter & Sons Company, Providence, submitted a most appreciative memorial, which was unanimously adopted as the expression of the association.

The first actual connection between the Chicago railroads and the Chicago Subway was made last week, when the shafts from the subway tunnel to the tracks of the Chicago & Alton Railroad at Van Buren street were opened. Five shafts connecting the railroad with the subway will be used for coal traffic. The Chicago & Alton brings from seventy-five to a hundred carloads of coal into Chicago daily, intended for the downtown district, and this will be delivered through the tunnel. Connection with the company's warehouse will be made by elevators later.

The Waring Pressure Regulators.

A new line of valves for regulating the pressure of steam, water, air and gas, invented by J. B. Waring, is now being manufactured by William G. Coats, 45 Clinton street, Newark, N. J. The accompanying illustrations, Figs. 1 and 2, show the general external appearance of the Waring steam pressure regulating and reducing valve and the Waring water pressure regulator. Figs. 3 and 4 show sections of the same valves lettered to distinguish the several parts.

The principal features of the steam pressure regulating and reducing valve are the poppet valve D, the opening and closing of which are accomplished by the piston C and the controlling valve F. The final pressure of the steam after passing the valve can be regulated to a constant amount regardless of the initial pressure of the steam. The pressure determining factor is the coiled spring V on the stem R of the controlling valve. It will be noticed that the valve is without diaphragms or arms with weights, this spring being the only part which is necessary to adjust in regulating the pressure.

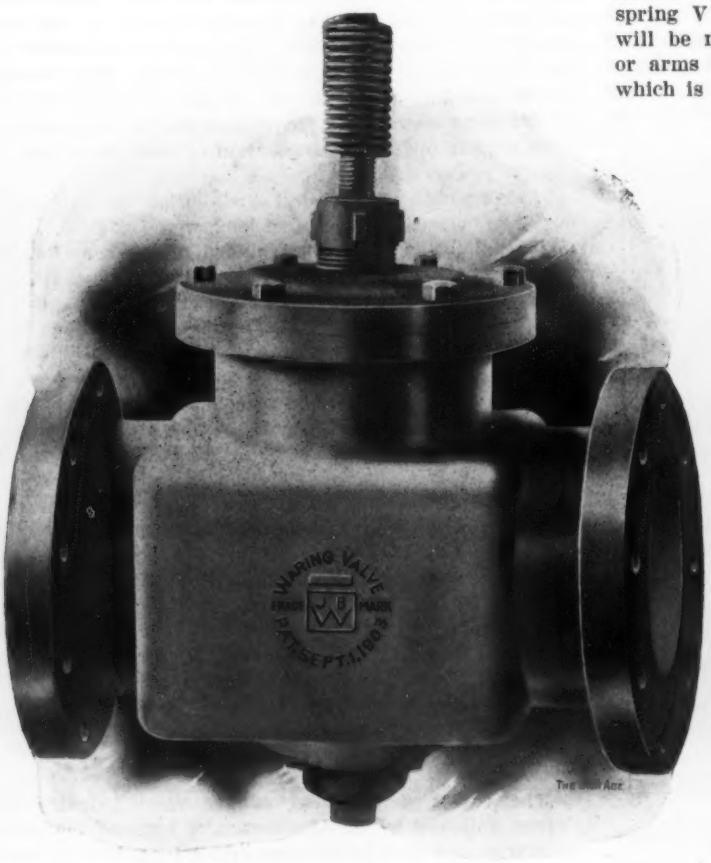


Fig. 1.—The Waring Steam Pressure Regulator.

Fig. 2.—The Waring Water Pressure Regulator.

Steam is admitted at the inlet end of the valve and fills the space O around and under the valve D, lifting the valve from its seat and allowing steam to flow through and fill the system beyond the valve. As the pressure in the system rises to the predetermined point the controlling valve F is raised by the low pressure steam entering the space M at the bottom of the valve F through the passages L and N. The groove 2 is always filled with live steam, which is admitted from the inlet space through the holes G, the screen H and the passage I. When the controlling valve is forced to the top of its cylinder the groove 2 connects the upper port leading into the passage I with the lower port to the passage J, which allows live steam to enter the space S above the piston C. This piston, having a greater diameter than the main valve D, forces the latter to its seat, reducing the inflow of high pressure steam. When the final pressure again falls the valve F is forced down by the spring V until the groove 3 connects the upper port in J with the port at the top of the passage K. This allows the live steam in the space S to escape through the passage L into the low pressure side of the valve. The pressure above piston C being thus reduced, the initial steam pressure forces valve D open, restoring the final pressure. The up and down travel of the

piston C and the valve D involves the movement of the steam surrounding the valve rod R and the stem projecting from the lower side of the valve. These are packed at U and T, where they project through the valve casing A and the bonnet B. It has been found in actual operation that the valve operates very quickly and positively, doing away with wire drawing, and so reducing erosion of the valve seats, prolonging their life.

The water pressure regulator is of somewhat simpler construction and operates its valve directly without a controlling valve. The water enters at A, Fig. 4, raising the valve K, and flows through the space M and the outlet B to the system. When the desired pressure has been reached the pressure in the space above the piston

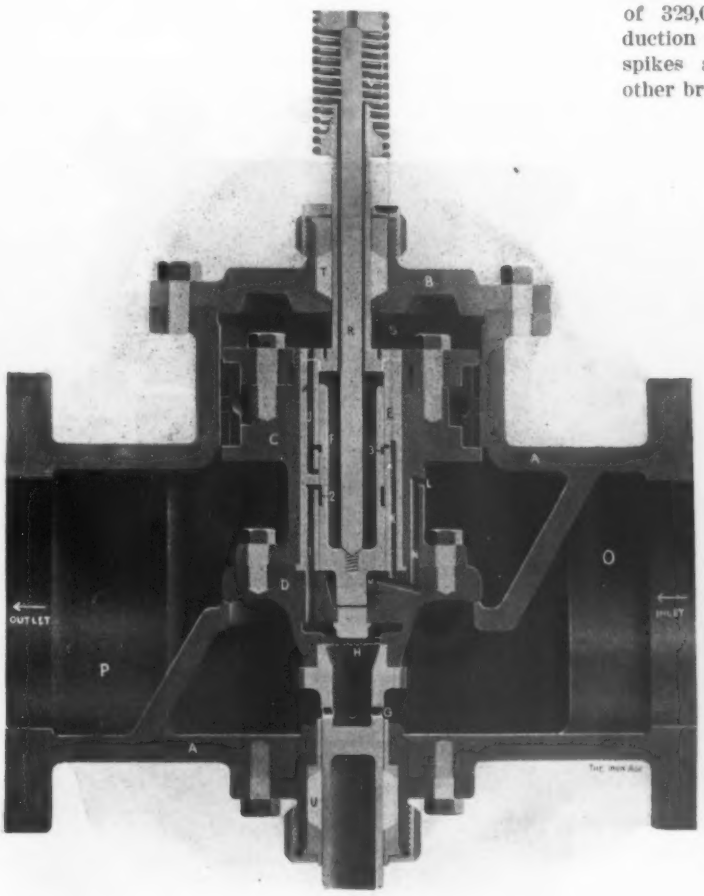


Fig. 3.—Sectional View of the Steam Pressure Regulator.

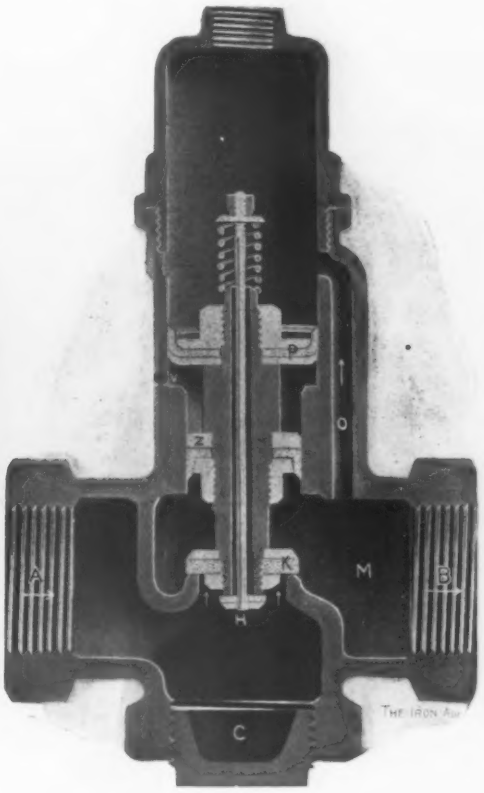


Fig. 4.—Sectional View of the Water Pressure Regulator.

P, which communicates through the passage O with the space N, becomes sufficient to force the piston down, closing the valve K, as the area of piston P is in excess of the valve K by an amount proportional to the desired difference between the inlet and outlet pressures. As the pressure becomes reduced K opens, again restoring it. Pressure in M is kept from the lower side of the piston P by the smaller piston Z, and a vent hole, V, permits air to flow in and out as the volume in the space between the pistons P and Z varies with the movement of the valve. The valve H is a spring check valve designed to relieve the system if the pressure in M becomes greater than the initial pressure. This might happen if the water in the system were heated and backed up in the piping. The pressure in the outlet side may be further reduced by using a spring in the upper cap to bear upon the piston P. A pressure gauge may be screwed to the top of the valve to indicate the pressure at all times. This valve is claimed to give a uniform house pressure regardless of the initial or main pressure and to prevent straining or hammering of the pipes. The valve is made in six standard sizes, from ¾ inch to 2½ inches.

Pennsylvania Iron and Steel Statistics.

According to the report of Robert C. Bair, Chief of the Bureau of Industrial Statistics, the production of iron and steel in Pennsylvania decreased in 1904 as compared with 1903.

The production of pig iron in the State in 1904 amounted to 7,411,300 gross tons, a decrease as compared with 1903 of 770,350 tons, but as compared with 1896 the gain was 3,384,950 tons. The value of the output of 1904 was $101,830,467, a decrease of over $29,000,000, as compared with the value of that of 1903. The number of persons employed in pig iron making was 14,087.

The rolled iron and steel made in the State in 1904 amounted to 8,056,306 tons, a loss as compared with 1903 of 329,055 tons. There were decreases in the production of steel rails, structural shapes, cut nails and spikes and plates and sheets, but there were gains in other branches of production of rolled iron and steel. In 1904 there were employed in these lines of the industry 91,146, a decrease of 8142 from 1903, while the wages amounted to $55,932,427, also a decrease from 1903.

The product of tinning plate, tinned and untinned, in 1904 was 515,162,964 pounds over 20,000,000 pounds less than in 1903, and the value of the product was $18,504,358. The entire production of tin and terne plate for 1904 was 542,474,201 pounds, against 554,233,702 pounds in 1903.

A consular communication to Washington summarizes a recent report of the Association of German Machine Tool Works. The demand for machine tools in Germany increased considerably in the past few months and exports were greater. For the first six months of 1905 machine tool exports were 36,155,810 pounds, against 29,982,860 pounds in the first half of 1904. It was found, however, that other countries were making greater efforts than before, and thus the difficulties of the German export trade seemed to be increasing. The price of machines in general has risen, though there is a lively competition for most business. The association favors a commercial treaty with the United States.

Buffalo Armor Plate Punches and Shears.

Two new types of hand operated combined punches and shears manufactured by the Buffalo Forge Company, Buffalo, N. Y., are shown in the accompanying Figs. 1 and 2. The first is known as the direct lever type and the second as the cam type.

They are machines that are particularly useful for cutting stock, roughing out and trimming work or punching channels, angles or T-bars. All parts are of armor plate, drop forgings or crucible steel with the exception of the stands, which are cast iron. Armor plate has been adopted for the frames proper as it is considered superior to cast iron for service where sudden shocks and irregular strains are common, as is the case in tools of this class. Another desirable result in using armor plate is that the weight of the machines is considerably reduced.

The levers are made from drop forgings with the bearing surfaces carefully machined and fitted to avoid lost motion. The arrangement of the lever combinations is such as to give the greatest pressure at the proper point of the stroke. The jaws of the shears are made of crucible steel, properly tempered, and are so fastened in the frame that there is no giving or springing while in use. It is claimed that their cutting edges will not chip or break under continuous use on work for which they are designed. The punch blocks are made from drop forgings and have three holes of different sizes. The attachment of the punch blocks to the head allows them to be shifted when it is desired to punch a larger or smaller hole.

The punch and shear shown in Fig. 1 is made in three sizes, the largest being capable of punching ⅝-inch holes in ½-inch plate or shearing flat bars ⅝ x 3 inches or round bars 1 inch in diameter. The second size punches ⅜-inch holes in ⅜-inch plate and shears bars ⅜ x 3 inches or ¾-inch round. The smallest punches ¼-inch holes in ¼-inch plate and shears bars 5-16 x 2 inches or ⅝-inch round. The throat depths of the punches are respectively 5 inches, 4¼ inches and 4 inches, and the lengths of the shear jaws 4½, 4¼ and 3 inches. The weights are 345, 175 and 125 pounds, respectively.

These same machines are made with cam and roller action, as illustrated in Fig. 2. They are somewhat more compact in appearance, but not so easy working as the direct lever type. Similar machines are built in which the shearing and punching mechanisms are independent, being operated by separate levers.

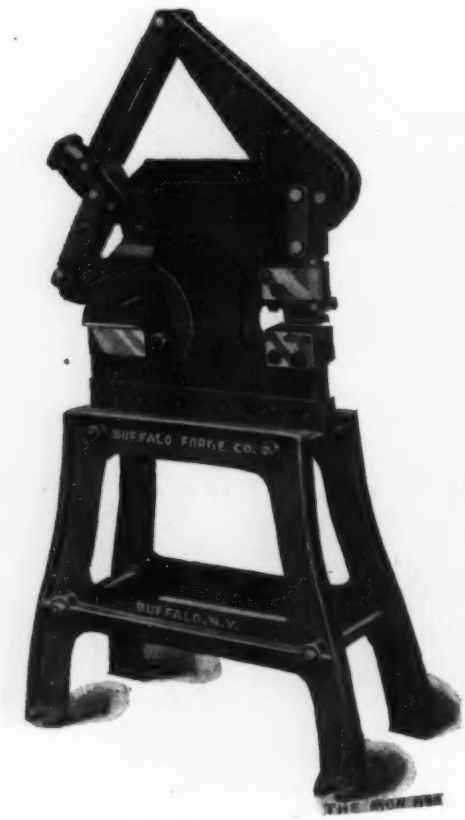


Fig. 1.—Direct Lever Type Combined Punch and Shear.

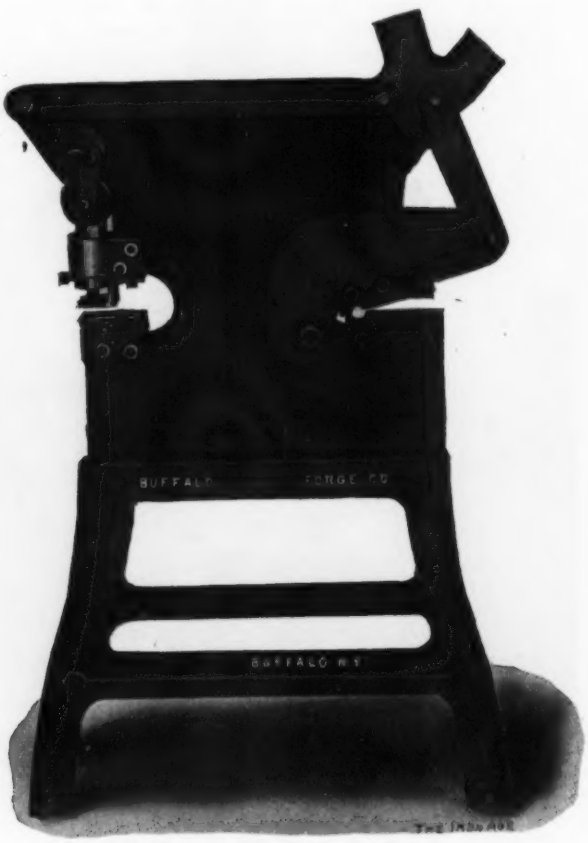


Fig. 2.—Cam Type Combined Punch and Shear.

The S. Obermayer Company, Cincinnati, Ohio, manufacturer of foundry supplies, states that numerous inquiries have been received for a reliable and efficient parting compound for parting molds for any sized castings made in iron, brass and other metals. The company states that for this purpose Partamol is now being used successfully in many foundries. This compound is claimed to give the best results, to increase the value of the output and is a saver of money. Those who have used it speak in highest terms of its merits. The company states that ¼-pound sample box, which will be sent on application ,will prove sufficient for giving this compound a thorough test.

Manufacturers who are members of the Association of Licensed Automobile Manufacturers have decided to enter into scientific experiments to ascertain precisely what grades and compositions of steel are best for the production of a perfectly safe and reliable automobile. The various automobile makers have been ordering differently. One maker specifies a certain grade of steel for its crank axles and another for its shaftings and other parts, while other makers will order totally different kinds of steel for the same parts. Under these circumstances it has not seemed advisable for a steel company to experiment for any one customer and consequently a great deal of haphazard practice is current in the trade. The statement is made that Henry Souther has been engaged as its metallurgist by the association and under his direction a large steel manufacturing company will make the experiments.

The White and Kernan Hot Blast Stove.

In an effort to overcome some of the troubles incident to the use of the ordinary two-pass stoves for blast furnaces the White and Kernan hot blast stove has been devised and is now being introduced by F. L. White of Aspinwall, Pa. The various small piers in the usual two-pass stove, which are hard to keep clear of dust and when dirty require a long shut down to clean, are superseded, as shown in Fig. 2, by arches extending across the whole inner diameter, from shell wall to shell wall. This gives a large unobstructed chamber, with nothing to prevent a free passage of the products of combustion when the stove is on gas or an even distribution of incoming air when the stove is on blast. The cast iron casings of the small piers commonly employed are always affected by the cutting action of the cold blast. The arches, as shown in Figs. 1 and 2, are braced laterally by keys or brace brick set between them.

The girder brick which support the checker work are unique. As shown in Fig. 3, the end of each girder brick is formed with an inclined face and a shoulder at the bottom. These inclined faces rest on corresponding inclined blocks on top of the arch walls, having spacing between, forming pockets for the ends of the girder bricks. Should any girder brick crack or break the evenly distributed load of the checkers tends to close the crack, because of the inclined surfaces on which the girder rests, thus preventing it from falling out.

The checker bricks are made of the shape shown in the upper portions of Fig. 3 and are designed to form a perfectly bonded checker brick. As arranged they give a round hole 8½ inches in diameter, with a partition 3½ inches thick between holes, but can be made of any size, furnishing any desired opening or partition. In laying the checkers, the first course, which bridges the girder tiles, has four, forming a circular opening. Above are three, five or six to the opening, forming a rigidly bonded mass of brick work, with a minimum of liability to expand or contract out of shape. The second course breaks joints with the first, and the succeeding courses break joints and bond all the way through.

The White and Kernan stove is considered of particular service in cases where blast furnace gas is not washed and carries over considerable flue dirt. Several 20-foot stoves have been installed with the arches as shown in the illustration, but using the ordinary hexagon checker brick. The Lucy furnaces of the Carnegie Steel Company have seven stoves equipped in this way. With this arrangement the bottom chamber has been cleaned in three hours' time and the whole stove in 48 hours. The blast temperature has ranged from 1000 to 1500 degrees.

The Phillips Sheet & Tin Plate Company.—At a meeting of the directors of this company held in Pittsburgh October 10 E. W. Mudge was elected president of the company to fill the place made vacant by the death of J. R. Phillips last spring. Mr. Mudge is vice-president of the La Belle Iron Works, Steubenville, Ohio, and is considered an authority on all subjects pertaining to the iron and steel industry. He is located in Pittsburgh, where he has large interests. At the same meeting further improvements to the extent of $20,000 were contracted for, including an additional 20-ton electric crane, with a 5-ton auxiliary hoist, a duplicate electric plant, two new cold mills, four additional stacks in the tinhouse, and also a spare river pump. This additional equipment will make the plant one of the best equipped tin mills in the country. The general offices and works are located at Clarksburg, W. Va.

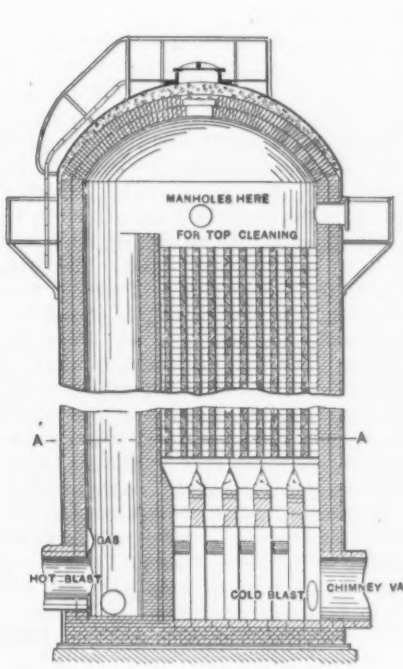


Fig. 1.

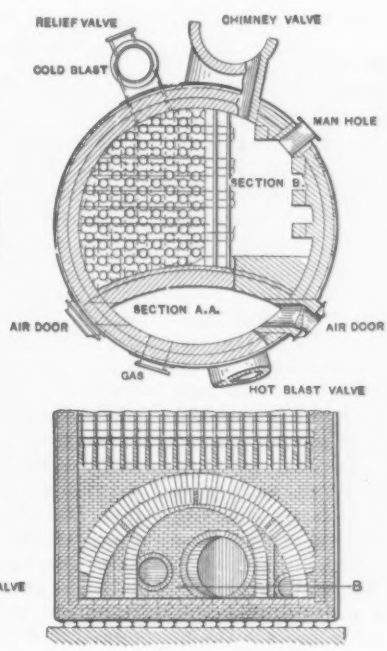


Fig. 2.

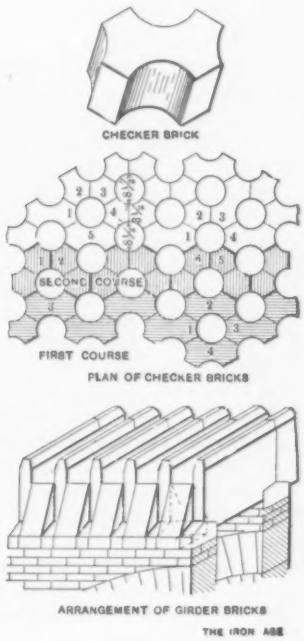


Fig. 3.

The White and Kernan Hot Blast Stove. Construction of Arches and Arrangement of Checker and Girder Bricks.

German iron founders are seriously troubled over the competition of blast furnaces which are making castings direct from the furnace. It appears that technically an increasing number of blast furnaces are making a success of direct casting and are invading the markets of their customers for pig iron. The founders are talking of boycotting the guilty iron makers, and are discussing also the plan of getting together to build their own blast furnaces and retaliating.

In the United States, 743 failures, involving $89,960,745, were reported to *Bradstreet's* for the nine months ending September 30, 1905. This is a decrease of 3.8 per cent. in number and 21.6 per cent. in liabilities as compared with 1904. Compared with 1903 there is an increase shown of 7.7 per cent. in number and 1.2 per cent. in liabilities. Canadian failures for nine months were 1020, involving liabilities of $10,676,595, an increase of 22.6 per cent. in number and 38.7 per cent. in liabilities over the first nine months of 1904.

The Kjellin Electric Steel Furnace.

The recent incorporation of the Gröndal-Kjellin Company, Limited, of London represents the beginning of active operations looking to the introduction into Great Britain of the Gröndal system of iron ore concentration and briquetting and the Kjellin process for the production of steel by electricity. Arrangements have been made by which Naylor & Co., 45 Wall street, New York, will represent both processes in the United States. Reference was made in *The Iron Age* of June 22, 1905, to the plant the Pennsylvania Steel Company has recently built at Lebanon, Pa., to use the Gröndal process, as described in a paper read by Prof. Henry Louis at the May meeting, 1904, of the Iron and Steel Institute. In view of the expectation that the Gröndal-Kjellin Company, Limited, through its American representatives, will introduce the Kjellin electric furnace into the United States a more extended description of its construction and operation than we have yet given will be found of interest. The details given below are taken from an article in *Stahl und Eisen* on the operations with the Kjellin furnace carried on at Gysinge, Sweden, and prepared by Chief Engineer V. Engelhardt:

Construction of the Gysinge Plant.

The Kjellin process is carried out at Gysinge, in Sweden, four hours by rail from Stockholm. In 1899 the first Kjellin induction furnace for the production of steel by electricity was erected. This was completed in February, 1900, and was put into operation on March 18. The capacity for which it was designed was a charge of 80 kg., the energy absorbed being 78 kw. The yield was 270 kg. in 24 hours and the average power consumed amounted to over 7000-kw. hours per ton of steel. Another furnace of a capacity of 180 kg., which was completed in November, 1900, could turn out 600 to 700 kg. of steel in 24 hours, the energy at the dynamo being 58 kw. The time occupied for one heat was three to four hours and the charge was tapped in quantities of 100 kg. at a time, the average power required per ton of steel produced being thus 2140-kw. hours. On July 11, 1901, the Gysinge cellulose factory burned down and extra power thus became available for a still larger furnace, requiring for its operation 165 to 170 kw. From this furnace the data below have been collected.

Fig. 1 shows the arrangement of the Kjellin furnace. The furnace represents in principle a transformer in which the circular trough A takes the place of a single short circuited secondary winding, the trough forming the melting bath of the furnace. This trough is closed with the cover B, which is built up of sectors of refractory bricks reinforced with flat iron plates. The central space within the ring is occupied by the core C, composed of soft iron plates 0.5 mm. thick and covered with tissue paper insulation. This core is surrounded by a copper wire coil, D, insulated with asbestos. Outside the furnace the core assumes a rectangular form. The primary coil is connected direct to the alternating current machine. The furnace at work at Gysinge, which is worked at a pressure of about 3000 volts, has on the high tension coil 295 turns, corresponding to an apparent pressure of about 10 volts within the furnace. The strength of the induced low tension alternating current in the melting bath, without taking into account the hysteresis losses, corresponds to the current strength of the generator multiplied by the number of turns in the primary coil, since there is only a secondary winding. By means of this arrangement a low tension alternating current of considerable strength is obtained without having, as in some furnaces, to employ electrodes by which energy is dissipated and which soon wear out. No large copper conductors to the furnace are required. In Fig. 3 it is shown that the portion of the magnet core which is inside the primary coil is not square but cruciform in section, so that at the edges four ventilating openings occur, through which air is blown in order to carry off the heat generated in the transformer.

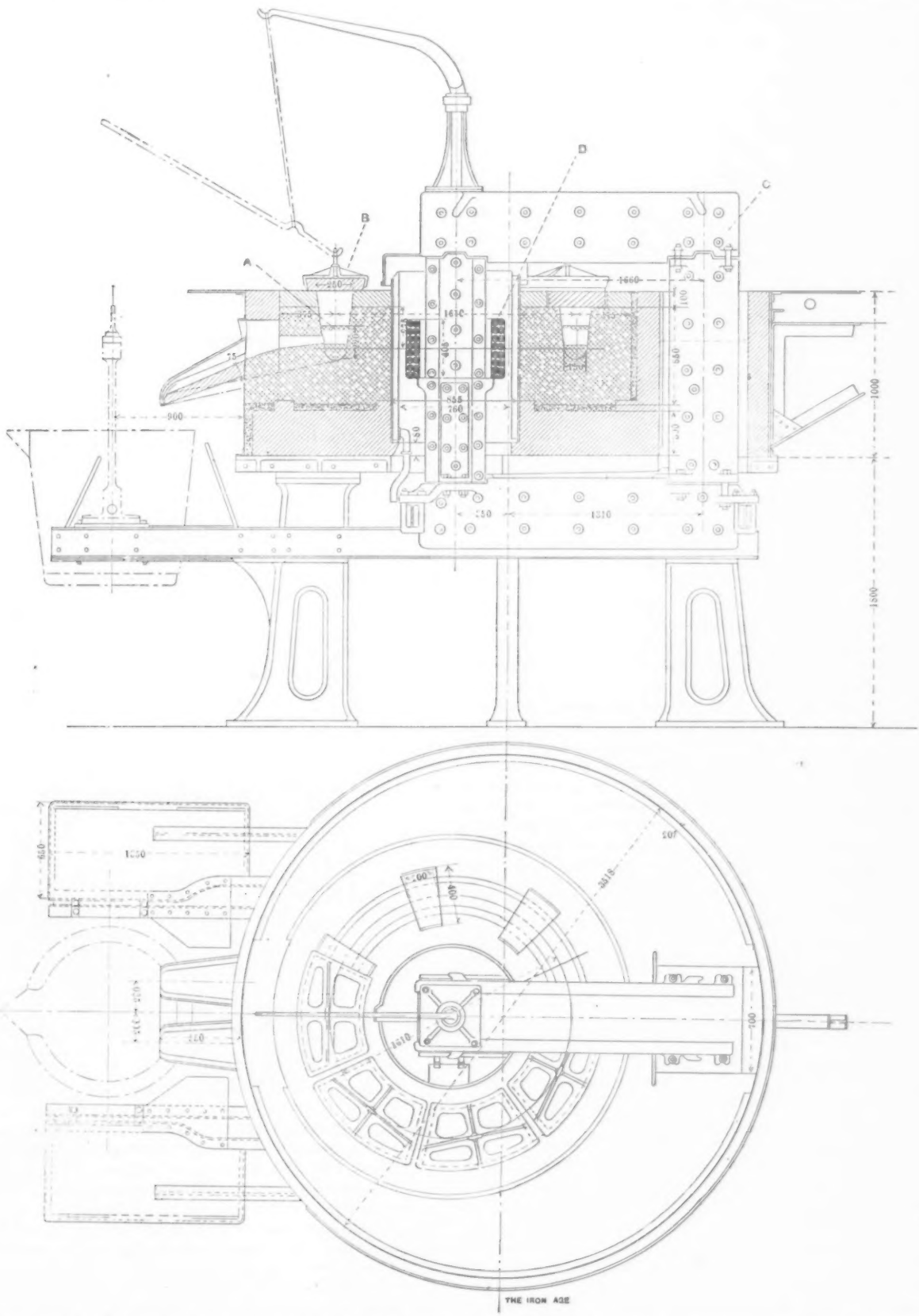
With this object four 1-inch tubes are fitted, through which air is blown at a pressure equivalent to about 1⅝ inches in the mercury column. At Gysinge this air is supplied from the blowing engines of the forge, but it would be equally possible with the relatively small fluctuations in the primary potential to use an electric fan driven direct from the dynamo. To protect the primary coil from the heat of the furnace wall a water cooled cylinder open at one end is placed around it. The cylinder is made of sheet brass 1.5 mm. thick, brazed together and insulated with wood. In the space between the cylinder and furnace wall the temperature never exceeds 80 to 100 degrees C., and the temperature of the cooling water at the outflow is 40 to 50 degrees C. The only real alteration in construction proposed as the result of experience is in the shape of the cross section of the melting trough. The present section is oblong, with a rounded bottom; consequently the opening for charging is too narrow, which is particularly inconvenient when loose scrap is used for charging, the shovels also being apt to become magnetized. It is therefore intended in building the next furnace to make the melting trough triangular in cross section, but the rounded bottom will be retained. The sloping walls of the lining are easier to repair than the perpendicular ones, and the contact within the furnace is more readily maintained, even when a fairly large quantity of metal is run off.

Furnace Lining and Method of Operating.

At Gysinge formerly an acid lining of silica bricks was used. It was found, however, that this was not very durable and that the steel absorbed too much silicon. A basic lining was therefore substituted. The lining is 12 inches thick and the arrangement is shown in Fig. 1. For making the lining 10 kg. of finely ground burnt magnesite is mixed with every 500 kg. of sintered magnesite, and to this is added 40 kg. of Holland clay, reduced to a paste by mixing with water. The whole is then thoroughly mixed and rammed at once. The bottom is first rammed, then the templet is placed in position and the side walls are then rammed. To renew the entire lining about 2700 kg. of sintered magnesite is required together with the corresponding additions. Above the rammed mass, but in any case above the level of the molten charge, is laid a course of magnesite bricks. Regular repairs are necessary only at the slag line, and the faulty places are therefore always exposed after tapping and can be attended to before recharging the furnace. On one furnace lining 285 tons of steel was melted. The cost of putting in the lining was 454.72 kr., or about $123.50. Repairs in 12 weeks' working were $38 and the labor required to pull out the lining cost $13.50. The total for a furnace lining was thus $175, or about 61 cents a ton.

The charging platform is about on a level with the upper edge of the melting trough, which is only slightly raised above the surrounding brick work. On the charging platform are the switchboard, the scales for weighing the charge and a small forge and anvil for making the forging tests. During the last hour or one and a half hours of each heat—that is to say, when the charge under treatment is completely melted and the leading hand at the furnace has made the colorimetry test—the material to form the next charge is weighed up and placed in readiness near the furnace. Immediately after tapping the material is charged as a rule in two portions, the time occupied in each case being a quarter of an hour. The interval between the first and second charging is about one hour. In two hours from the time the first charging begins the whole of the material is melted and at the end of another hour the carbon content is checked colorimetrically and by the forging test, and it is corrected if too low by adding a little pig iron, and if too high by the addition of pure ore. A quarter of an hour before tapping 10 to 15 kg. of 12 per cent. ferrosilicon is added to insure that the ingots are free from blowholes. The charge is run off into a ladle lined with fire clay and carried on a crane, and if the molten steel is not quiescent a small quantity of pure aluminum (about 50 grammes for a whole charge) is added. As the ladle at Gysinge does not hold a complete charge, the metal is allowed to run off through the pouring hole in the bottom while the charge is still running from the furnace. The ingot molds which receive the metal are placed on a turntable underneath. These are of the ordinary construction, being two-

part and held together with hoops tightened with wedges. Each charge was made into eight ingots, four of which weighed 85 kg., three weighed 100 kg. and one weighed 200 kg., the mean capacity of the furnace being 1350 kg. and the quantity tapped at one time 840 kg. The time is heated by means of a charcoal fire. The waste ends are left on the ingots unless it is intended to work them up on the premises. In that case they are cropped off and returned as scrap steel to the furnace. The hoops are knocked off the ingot molds when the metal has set and



Figs. 1 and 2.—Sectional and Plan Views of the Kjellin Furnace for the Production of Steel by Electricity. Dimensions are given in millimeters.

of one heat was four hours. With so short an interval between charging the ingot molds did not require much warming up, and they were only blackened inside with burning Swedish resin in order to give the ingots a smooth surface.

On the other hand, the clay plugs are warmed in an oven for an hour before tapping the charge and the ladle the molds are thrown on to iron rails. The ingots on falling out are drawn on to another set of rails to allow them to cool and after cooling are weighed.

Power Absorbed for Scrap and Ore Processes.

The records showed that in 124¾ working hours 26,075 kg. of ingots had been cast, or, in round figures, about 5000 kg. in 24 hours. The average energy at the furnace

amounted to 167.1 kw.=4010.4 kw.-hours daily, which corresponds to 802 kw.-hours per ton of steel produced. A consumption of 770 kw.-hours per ton of steel was on another occasion recorded as the average for 48 charges in eight working days with 170 kw. at the furnace and with heats of four hours each. In regard to working with hot metal it was not possible to obtain the data, as the blast furnace was not working. It was only possible to make an extract from the record of such a test, according to which 650 kg. of hot metal was poured into the empty furnace and 1300 kg. of cold pig and scrap was added. In 6¾ hours with 182 kw. the charge was finished, and the losses at the furnaces were 87.5 kw. Assuming 2 per cent. waste of material in the furnace, the power

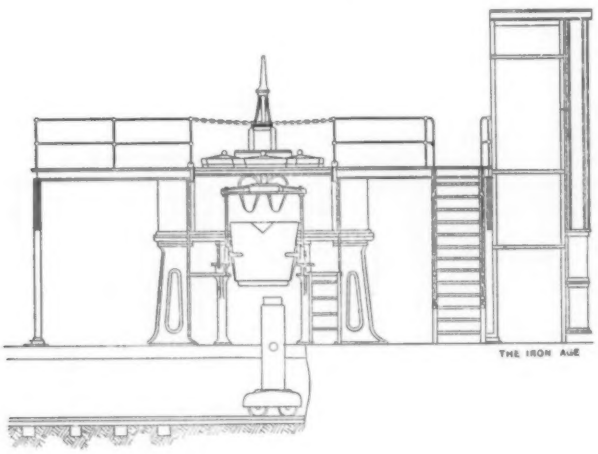


Fig. 3.—Front Elevation of Furnace, Showing Ladle and Ingot Car in Position.

used in the production of 650 + 1300 — 39 = 1911 kg. of steel was therefore 1228.5 kw.-hours = 643, or, in round figures, 650 kw.-hours per ton of steel.

With the ore process the time for one heat is 50 per cent. longer—that is, it lasts six hours—and the power required per ton of steel amounts to about 1200 kw.-hours. Formerly the operations were so regulated that with 165 kw. at the furnace, in four heats of six hours each, 4100 kg. of ingots was cast, corresponding to 966 kw.-hours per ton of ingot steel. By reducing the size of the charge and expending the same amount of energy at the furnace the losses due to conduction and radiation were reduced. For larger types of furnaces—for instance, one of 736 kw., such as would be necessary for work on a scale capable of competing with the ordinary open hearth furnace—the power consumption is lowered still further. A furnace of 3740 kg. capacity and yielding a charge of 2000 kg. will take about 590 kw.-hours per ton of steel when working with cold pig and producing 30 tons daily. If liquid pig is charged the yield rises to 36 tons daily, and the power required is only 490 kw.-hours per ton. From this furnace six charges daily are obtained of 200 kg. each = 1200 kg. per day, the raw material being preheated to a red heat. The average power is 61 kw. at the furnace, which corresponds to 1220 kw.-hours per ton of steel.

Thermal Efficiency.

In calculating thermal efficiency it is assumed that 1 kw.-hour equals 864.5 calories. The specific heat of iron from 0 degree to 1300 degrees C, averages 0.20, and above that temperature 0.48. The heat required to melt 1 kg. of wrought iron or steel is 40 calories and for 1 kg. of pig iron 30 calories. In a cold charge the material required is 9868 kg. of pig iron (including 338 kg. ferrosilicon) and 17,100 kg. of scrap—a total of 26,968 kg., from which 26,131 kg. is tapped and 400 kg. left in the furnace; total, 26,531 kg. Thus there is used for one ton of steel 372 kg. of pig iron and 645 kg. of scrap, a total of 1017 kg. The ferrosilicon addition (12 per cent. Si equals 1.56 kg. Si per ton. The carbon burned out (0.5 per cent.) equals 5 kg. per ton. Final temperature is assumed to be 1600 degrees C. The computation gives a total of 447,828 calories, with deduction of 24,580 calories for the carbon burned to CO and the silicon burned to SiO_2. The remainder is 423,248, which, divided by 864.5, gives 489 kw.-hours per ton of steel. The efficiency of the furnace when working with the scrap process and with cold charging is therefore as follows:

(*a*) With the former method of working with six-hour heats $\frac{489 \times 100}{966} = 50$ per. cent. approximately. This figure agrees fairly well with the Kjellin figure of 47 per cent.

(*b*) With the method of operation in use at the time of the writer's visit with four-hour heats $\frac{489 \times 100}{800} = 60$ per cent. approximately.

(*c*) With the furnace calculated for a power of 736 kw., and assuming that 590 kw.-hours are required for the production of one ton of steel, $\frac{489 \times 100}{590} = 80$ per cent.

In charging in part with hot metal it is computed that the raw material per ton of steel was 340 kg. of hot metal and 680 kg. of cold raw material. The calculation of the theoretical amount of heat used shows 331 kw.-hours per ton of steel.

At Gysinge the dynamo has a vertical shaft coupled direct to a 300 horse-power turbine. The dynamo is a separately excited machine and the current is single phase alternating of 3000 volts at 15 periods. The retardation varies of course either according to the size of the general charge in the furnace or according to the stage for the time being of the charging operation, depending upon whether all raw materials have been charged or not.

The process as now carried on is purely a scrap process and in this form it does not render possible the elimination of injurious constituents of the raw material. The various constituents of the pig iron and scrap consequently recur in the steel in the same proportion in which those materials are mixed in the charge, carbon being the only exception. In calculating the charge a constant, which is based upon experience, representing waste of carbon owing to admission of air during charging and to presence of oxygen in the raw materials, &c., is deducted from the average carbon content of the metal remaining

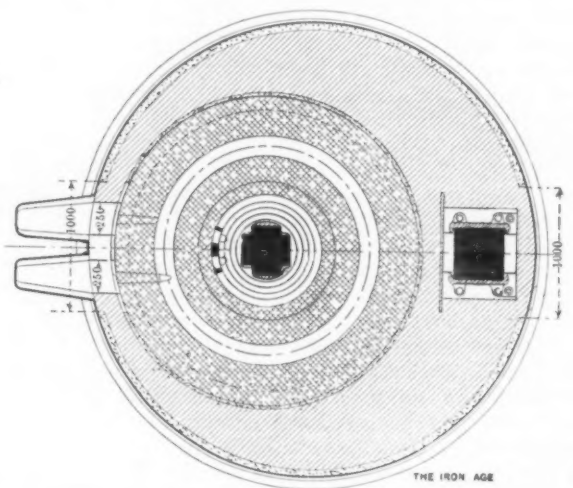


Fig. 4.—Horizontal Section, Showing Circular Trough, the Form and Position of Coils, and the Arrangement of Linings.

in the furnaces and of the raw materials charged. This constant averages between 0.4 and 0.5 per cent. and is usually taken at the mean figure of 0.45 per cent. The exact control of the charge is effected by making additions of pig iron or ore as the circumstances require and as may be ascertained to be necessary on determining the carbon by the colorimetry test. If the percentages of sulphur and phosphorus in the raw materials are at all high a successful result can only be hoped for by using a mixed ore and scrap process or the pure ore process, and a charge was therefore worked using the most phosphoric pig iron in stock at the works. The addition of ferromanganese is made when recharging the cold furnace, but only if the pig iron of the first charge has taken up sulphur from the coke during remelting in the cupola.

Product of the Kjellin Furnace.

The electric furnace at Gysinge is chiefly employed in the regular production of tool steel. It is also sometimes used for experimental work on special iron alloys. The steel is delivered not only in the form of ingots and rods, but is worked up into finished articles in the forge attached to the works. The specialties manufactured by the Gysinge works consist of drills and chisels, forged stamping tools, steel forgings to sketch and forged steel for gun barrels of small and large calibre, magnets, small parts of machines, &c. The special qualities of this steel are its great elasticity, absolute homogeneity and density, softness, the high proportion of carbon which can be put into it and its excellent magnetic properties. Steel containing up to 2 per cent. carbon is manufactured and if properly softened is said to be easier to treat than other kinds of high carbon steel. Steel containing up to 1.4 per cent. carbon can be welded to iron merely by using a sand parting. The steel is also recommended for light shields for quick firers and naval guns and for ammunition wagons. Plates of Gysinge steel 3 mm. in thickness have resisted modern nickel covered rifle bullets at a distance of 200 meters, while plates of 4 mm. thick have withstood the same at 100 meters. Gun barrels of this steel tested at Liége have withstood a pressure of 2000 atmospheres, whereas those of other steel burst with 1300 atmospheres. According to Dr. Neumann, in *Stahl und Eisen*, 1904, the Gysinge steel is fully equal in quality to the best crucible steel.

Comparisons with Other Processes.

It is claimed that the Kjellin process will bear comparison both with other electric furnaces and with the crucible and open hearth furnaces which are used for production on a large scale. Employing no electrodes, the Kjellin furnace does away with the outlay on renewal of these and the loss of power caused by them, and also saves the expense of sinking fund and interest on the cost of the large conductors necessary for conveying the current. Further, carbon electrodes exercise an influence on the carburizing of the charge, and charges may be spoiled by pieces of carbon falling into the metal bath owing to the corroding of the electrodes at the slag line. The carbon also exerts a reducing influence on the constituents of the slag, causing these to combine with the metal. The consumption of current, moreover, is claimed to be less than that required by other electric furnaces.

In comparing with the crucible process the consideration of the expense for crucibles is an important factor. The reaction which takes place between the material composing the crucible and its contents plays an important part. The steel takes up silicon from the refractory clay, and if graphite crucibles are used carbon is also absorbed. The same high density and freedom from gas which are the special features of crucible cast steel are also attainable with the Kjellin furnace. In making crucible steel with the Kjellin electric furnace the temperature can be easily regulated by varying the current in the melting trough. As no electrodes are used, no gases are in contact with the metal. Owing to the simplicity of the electric process and the increased size of the charge, a smaller number of workmen and less skilled labor can be employed than with melting steel in crucibles.

According to Neumann, in *Stahl und Eisen*, 1904, No. 16, p. 950, the crucible furnace requires 1200 kg. of coal, costing 12s., and about 40s. for crucibles per ton of steel. Others calculate the coal consumption at two tons per ton of steel, the cost for coal being then 20s., but, on the other hand, the cost in crucibles is less. It may in any case be safely assumed that the average cost of these two items per ton of crucible steel is at least 20s. to 40s. A comparison of the cost of production of special quality steel can only be based on the working cost of a medium sized Kjellin furnace, such as the one at Gysinge, using 165 to 170 kw. By the Kjellin process, with six-hour heats and a daily yield of 4000 kg., the expenses corresponding to outlay on fuel and crucibles would be: 966 kw.-hours at 0.24d., or 19.32s.; cost of lining per ton, 2.5s. Total, 21.82s. With four-hour heats and the lining lasting the same length of time the corresponding costs would be: 800 kw.-hours at 0.24d., or 16s.; cost of lining per ton, 1.75s. Total, 17.75s. In these calculations no account is taken of the saving in labor.

Comparison with the Open Hearth Furnace.

A large type of Kjellin furnace must be taken for comparison with the open hearth process. For instance, a furnace of 736 kw. = 1000 horse-power yields (owing to reduced loss by conduction and radiation) 30 tons daily with cold charging and 36 tons daily when charging with hot metal. Assuming, on the other hand, that the capacity of an ordinary open hearth furnace is 20 tons and that the heat with acid lining lasts from 8 to 10 hours and with basic lining from 10 to 12 hours, such a furnace will yield on an average about 48 tons daily. One ordinary open hearth furnace is therefore equivalent to 1 1-3 to 1½ Kjellin furnaces, the yields being estimated, of course, on the basis of the scrap process. The waste in an open hearth furnace amounts approximately to 5 per cent., and in this respect therefore the Kjellin furnace, with its waste of 2 per cent., works more economically. With regard to the quality of the raw materials the scrap would of course be of the quality usually employed for manufacture of steel on a large scale and not of special purity, such as is required for crucible steel. The product of the Kjellin furnace would also not be of the quality of crucible steel, but it would be as much superior to ordinary mild open hearth steel as steel manufactured in crucibles from inferior raw materials would be. Note is to be taken of a technical difference in the two processes. In the open hearth furnace the decarburization continues up to the end of the heat and recarburization becomes necessary. With the Kjellin furnace, on the other hand, no decarburization takes place after melting, and there is therefore sufficient time after making the colorimetry test to maintain a definite proportion by making suitable additions. The only drawback of the Kjellin furnace of a technical kind is that the charging of very voluminous scrap into the relatively narrow melting trough is a troublesome business, but this would be remedied by altering the form of the section. The life of the basic lining, which is three months, also compares favorably with that of the open hearth lining, which, according to data from a competent source, lasts at the most two months. The cost of maintenance in the case of the open hearth varies, of course, according to the price of the materials, but the average for the basic process is about 0.75s. to 0.80s., and with the acid about 0.85s. to 0.88s. per ton of steel produced.

For a Kjellin furnace of 736 kw., with a capacity of 3740 kg., and the weight of metal tapped at each heat being 2000 kg., the daily production amounts to 30 tons, or with hot metal to 36 tons, the power consumed being 590 and 490 kw.-hours, respectively, per ton of steel produced. The wages per unit of the yield are, of course, correspondingly lower in the case of large furnaces. According to the conditions of labor in Sweden, a furnace of the above mentioned capacity would require two melters at 3s. 7d. = 7s. 2d., and 14 laborers at 2s. 8d. = 37s. 4d., or 44s. 6d. altogether for 24 hours. With regard to the lining, the quantity of material used, compared with that necessary for the 170-kw. furnace, is in the ratio of 3 to 2 and it is assumed to last also 12 weeks. On the basis of the above figures the cost of production per ton of steel in a Kjellin furnace of 736 kw. capacity works out as follows:

Cost of 1 Ton of Mild Steel in a Kjellin Furnace of 736 kw. Capacity.

	Shillings	
Electric energy, taking the cost of power at 0.24d. per kw.-hour, and assuming that 0.6 kw.-hour is consumed per kg. with a charge of cold pig iron, and 0.5 kw.-hour per kg. with a charge of hot metal	12.00	10.00
250 kg. pig iron at 55s. per ton	13.75	13.75
790 kg. mild steel scrap at 45s. per ton	35.55	35.55
12 kg. ferrosilicon at 115s. per ton	1.38	1.38
Wages	1.48	1.23
Heating up	0.18	0.15
Furnace lining	0.43	0.36
Various materials	1.14	1.14
Ingot molds	1.30	1.00
Interest and sinking fund	1.21	1.00
Supervision and general expenses	3.00	2.50
Total	71.42	68.06

From this table it will be seen that the only larger item which is subject to any important variation is that which represents the cost of the power. If the cost of the kilowatt-hour does not exceed 0.24d. it would appear to bring the electric furnace within range of competing successfully with the open hearth process. The Kjellin process might be expected therefore to come into competition with the open hearth process as regards production on a large scale in those districts where, for instance, current could be generated by water power at a still lower figure, or where power gas, either from blast furnaces or coke ovens, is available. In the latter case it will also be possible to keep within the estimated figure of 0.24d. for the kilowatt-hour.

The Iron and Steel Institute.

Proceedings at the Sheffield Meeting.

The results of studies in the metallurgy of steel, particularly as related to segregation and heat treatment, were prominent in the reading and discussion of papers at the Sheffield, England, meeting of the Iron and Steel Institute, September 26-29. "Segregation in Steel Ingots" was the title of one of the most important papers, which was presented by Benjamin Talbot, of Middlesbrough. The author gave the results of experiments in which ingots were taken from the same heat with and without addition of aluminum, and the differences in respect to segregation noted between the ingots with aluminum and those poured with no aluminum. Seven ingots are represented in the tables the author gives. Some were top poured, others bottom poured, and some were in larger molds than others. In the case of two of the ingots the pouring was the same—from the top—but one was inverted immediately after casting. The ingots after cooling were cut through the center of one of the sides longitudinally, and drillings taken from holes at the intersections of 12 horizontal and 9 vertical lines drawn upon the planed surface, the holes being ⅝ inch diameter and ¾ inch deep. The drillings were analyzed for carbon, sulphur, phosphorus and manganese. Four of the ingots were of 20 x 24 inch, two were of 18 x 22 inch and one was of 13 x 16 inch section. The smaller ingots showed the effect of segregation as plainly as the larger ingots.

Aluminum Greatly Lessens Segregation.

As a rule the results show that in the case of ingots to which no aluminum has been added excessive segregation down the central line of the ingot occurs from about 6 inches from the top to about halfway down the ingot, that sulphur is the element which tends to segregate most, phosphorus next, followed by carbon, and finally manganese, the segregation of which latter element is so light as to be almost negligible.

In order to prove the importance of leaving the ingot always in a perfectly upright position until sufficient time has been given to allow the center to solidify an ingot was taken immediately after being cast and while its center was still quite fluid and inverted so that the base stood uppermost. After cooling in this position the ingot was cut open and analyzed. As was to be expected, the most segregated portion was found in the end which had been allowed to cool uppermost—that is, the broad end of the ingot—although this was the original bottom end. The ingot from the same cast which was not inverted has of course the segregated area in the normal position.

A chief feature of the tables presented by the author was the comparison made between two ingots of acid steel, one poured with and the other without the aluminum addition. Sulphur was the element showing the greatest difference. In the ingot poured with aluminum a limited strip in the center showed 25 per cent. more sulphur than appeared from the ladle test. The latter went 0.061 in sulphur, while analyses of drillings in the strip mentioned showed 0.070, 0.074, 0.073 and in one case 0.078. Analyses of the ingot poured without aluminum ran as high as 0.097, 0.141, 0.173, 0.102, 0.161 and in one case to 0.267. The average for a considerable area in the upper central portion of the ingot was 75 per cent. more than the ladle test.

Another point emphasized by the author is brought out by two tables of anaylses of fairly high carbon basic steel made from a phosphoric mixture and in which the carbon had been raised from dead soft to about 0.5 per cent., the percentage desired. He refers to the regularity in the percentages of carbon obtained as confuting the position of Continental writers who questioned whether sufficient regularity could be secured by this means.

In summarizing the results of the tests the author pointed out that by the use of aluminum a billet of much more regular composition is obtained. This is especially important in the case of carbon, as a rail from an ingot in which no aluminum had been used would show considerable irregularity in the carbon percentage, with a consequent lack of uniformity in wearing properties. Where the carbon segregated to the center corresponding areas were found at the sides where the carbon was less than the mean. Where aluminum was added the distribution of the carbon was found to be much more even and to approach more nearly to the composition given by the ladle test. The author did not put forward any explanation as to the reason for the increased homogeneity of steel to which aluminum had been added. His experience was that the aluminum appeared to make the metal set more quickly. This he was aware was against the view usually held by metallurgists that aluminum increased fluidity. He had found that not only did the addition of a little aluminum to the metal as it is run into the ingot have a marked effect in setting the surface, but tended also when added above a certain quantity to form cavities in the upper part of the ingot. It had been found with mild steel that the molds could be stripped sooner when aluminum was added. It was also observed that when the same quantity of aluminum—namely three or four ounces per ton of steel—was added to the metal as it ran into the ladle its effect was not so pronounced as when added in the ingot mold while the steel was being poured. He had usually added the aluminum when the ingot mold was about two-thirds full. The author thought it would be well worth while for other investigators interested in the manufacture of higher carbon steel to be used for rails, tires and similar purposes to follow up the matter to determine whether a more uniform and regular steel is not obtained by the use of aluminum. He considered the results secured well worth the small cost per ton of the aluminum addition. The chief result to be expected perhaps is in the decreased amount of crop-end that it would be necessary to cut off from the top of the ingot, added to the greater solidity of this portion and the lessened amount of segregation.

Quieting Effect of Aluminum.

J. E. Stead, in discussing the paper, called attention to the fact that carbon was about 18 per cent. less in the uppermost layer of the ingot, taking the average of the ingots of which analyses had been given. He noted also that the sulphur and phosphorus ran between 30 and nearly 40 per cent. less in the upper layer. He pointed out that Mr. Talbot's results showed another important fact—namely, that the interior of the ingot, the middle of the bottom half, contained much less carbon than the average. The steel to which aluminum was not added moved about in the mold, this motion continuing for a considerable time. The hotter parts rose from the bottom to the top, which was kept continually hot, and thus solidification was retarded. When aluminum was added the steel solidified slowly and there was no back motion. Apparently the upper crust solidified quietly. This was not because aluminum reduced the temperature, as the author of the paper thought, but that aluminum prevented circulation and the metal froze more rapidly than if aluminum were absent.

The speaker suggested the possibility of producing large ingots with all the impurities in the upper head, which can be rejected, and have the remainder as pure as possible. While he would not suggest that a huge ingot be stirred with a rod, there were ways in which the liquid could be kept in slight agitation during the setting. In the case of rails and certain other sections the

top of the ingot is not cut off. Segregation in rails, unless accompanied by piping or unsoundness, was not as harmful as some people believed. But in the case of larger castings he thought the suggestion of an agitation of the metal might result in fewer rejections. With regard to aluminum making steel more or less fluid he tried 20 years ago the effect of putting a small quantity of aluminum into steel and ascertaining how far it would flow along a spiral mold about 1½ inches wide and ⅜ inch in thickness. The ladle containing no aluminum at all was first poured as rapidly as possible into the spiral mold. It very soon stopped running. A little aluminum was put into and shaken up in the remaining steel of the ladle. This was poured into another mold exactly the counterpart of the first. Very much more steel ran in the mold in that case; the steel containing the aluminum flowed about three times as far as that containing none. On the face of it they would naturally assume that that was a proof that aluminum increased the fluidity of the steel, but on breaking up the steel and ascertaining its nature this assumption was soon found to be fallacious. The steel with no aluminum was very much honeycombed, and running along the mold it frothed up, and the metal was not sufficient to retain the heat. The spongy part lost its heat and became solid and prevented the passage of the steel. In the case of the aluminum it was melted, and as it naturally retained its temperature it got a very much greater distance. Those experiments showed that apparently aluminum did increase the fluidity, but it was not proved by the experiments that such was actually the case.

Overheated Steel.

A. W. Richards and J. E. Stead presented further investigations into the overheating of steel, the cause of the weakness of such steel and the method of restoring its strength. In a previous paper the authors had shown that, provided the heating was not carried to the point of disintegration, overheated steel could be completely restored to excellent quality and made even superior to what it was in the forged condition. Some authorities to whom the paper referred had questioned whether such steel could be completely restored. As some of the differences of statement evidently grew out of a confusion of "burnt" with "overheated" steel the authors presented the following definitions:

Overheating is heating at any point below that which produces incipient disintegration and results in the formation of large crystals. Burning is heating at or above the point at which such disintegration occurs; burnt steel is nearly always coarsely crystalline.

If these definitions are accepted the following facts should be remembered: (1) That all overheated steel is more or less coarsely crystalline. (2) That different steels apparently of the same composition vary in their susceptibility to disintegration. At a given high temperature one may be simply overheated while another may be burnt and partially disintegrated. (3) That burnt steel cannot be completely restored by reheating; it can be greatly improved, but is never equal to reheated steel which has not suffered partial disintegration.

Further experiments by the authors were detailed in the paper. Tests were made for tenacity and elongation, and there were made also ordinary bending, alternate bending and rotary tests and tests by reversals of stress. One-inch square rolled bars were taken containing respectively 0.06, 0.44 and 0.48 per cent. carbon and 0.2, 0.8 and 0.82 per cent. manganese. These were tested in the normal state, then after overheating, reheating, annealing and after sorbitic treatment.

The conclusions reached were that overheating reduces the power of the steel to resist fatigue, that reheating such steel more than restores the original good qualities and that when the steel has the carbon in the sorbitic condition its power of endurance is more than doubled. In explaining the causes of the weakness of overheated steel the authors stated that in the case of overheated steels containing above 1 per cent. carbon the brittle envelopes of carbide of iron which surround the grains or which pass through their substance are the places along which fracture most readily travels. Overheated steels consisting entirely of pearlite are very brittle and probably fracture is initiated in the plates of carbide. When the crystals are fine and the minute ferrite crystals are intimately distributed with the pearlite throughout the mass the strengths of the two constituents are averaged, the lines of stress pass over a multitude of each of them, and the pearlite, being the stronger, supports the ferrite and prevents it breaking down. If these conclusions are right it seems obvious that it would be an ideal condition if free ferrite were absent in carburized steels which have to be subjected to severe vibratory stresses. Ordinary structural steels in this condition can be obtained by heating to a suitable temperature, quenching and reheating at a lower temperature. The example described as sorbitic steel was prepared in that way. It was devoid of free ferrite and had double the resisting power of the normal forged bars.

In conclusion the authors said: "We wish to emphasize the fact that we do not maintain that steel initially bad, brittle and dangerous, owing to irregularity in the distribution of the elements or from other causes which have not yet been explained, can be made good by any kind of heat treatment. What we believe has been proved conclusively is that good steels which have been heated to any point short of incipient disintegration and made excessively brittle by such treatment can be completely restored to perfectly sound and reliable material. Also, that it is safest to heat to a temperature about 50 degrees above the critical points to insure the complete change of every portion of the steel, excepting in the case of the purest and most homogeneous steels, when the temperature of the upper critical points need not be greatly exceeded."

Vanadium Steel.

A paper by Leon Guillet discussing "The Use of Vanadium in Metallurgy" drew the following conclusions:

In all the cases studied up to the present vanadium considerably improves the mechanical properties of metallurgical products. Its effect may be characterized as follows:

1. On normal steels it produces a very distinct increase in the tensile strength and elastic limit and has no influence, or an insignificant one only, on elongation and contraction and upon resistance to shock. It slightly increases the hardness.

2. On quenched steels vanadium considerably increases the tensile strength and elastic limit; it acts in this way with almost as great an effect as carbon, yet notwithstanding this it does not increase the brittleness.

The influence of vandium in metallurgy is thus, in my opinion, of considerable importance. It is undoubtedly the element which, together with carbon, acts with the greatest intensity in the way of improving alloys of iron —that is to say, in very small percentages. It is to be specially noted, however, that alloys of iron, carbon and vanadium are more sensitive to heat treatment and mechanical handling than ordinary steels, but this does not appear to be any longer the case in more complex alloys, particularly in nickel vanadium steels.

The cost of production of ferro-vanadium is such as readily to allow of its addition, and if the price of ferro-vanadium is still high—about £1 per pound of vanadium contained—this must be attributed to the scanty demand, which is altogether inadequate, and consequently entails expenses of manufacture which are spread over but a very small output, thus considerably increasing the price. This state of affairs will disappear when the use of vanadium becomes more widespread. It may be concluded that the employment of vanadium in the manufacture of special steels is distinctly indicated, particularly in the manufacture of quaternary alloys such as iron-nickel-carbon-vanadium.

Nickel and Carbon in Iron.

G. B. Waterhouse, formerly of Sheffield, now of Buffalo, N. Y., presented a paper on the "Influence of Nickel and Carbon on Iron." In his experiments he used puddled bar iron and electrolytically deposited nickel. Nine ingots were made with the nickel constant at about 3.5 per cent. and the carbon rising from 0.40 per cent., which was the lowest possible, using graphite crucibles, to about 1.60 per cent. Pieces of each bar 12 inches long were placed in a gas fired muffle and in 85 minutes raised to

1000 degrees C. For 25 minutes they were maintained at this heat, then removed and cooled in air to recrystallize the steel and to remove any distortion or strain produced during the rolling. The bars were then packed in a wrought iron tube, placed in an annealing furnace at 500 degrees C. and brought to a temperature of 870 to 880 degrees C. in five and one-half hours. They were kept at this temperature for three hours, then the tube was withdrawn and cooled in a pit with many other filled pipes and the whole covered with ashes. In 24 hours the pipes were emptied, the steel being at about 150 degrees C.

The following conclusions were drawn from the physical and microscopic tests made:

1. Nickel decidedly raises the tenacity without materially lowering the ductility. The elastic ratio in pure nickel carbon steels is only slightly greater than that of carbon steels.

2. Annealing has a marked influence. It lowers the tenacity without greatly raising the ductility.

3. The constituents of steels with low percentage nickel in the unquenched state are: Ferrite, pearlite, cementite and graphitic carbon.

4. The pearlite of these steels shows a great readiness to segregate into its constituents—ferrite and cementite.

5. In this condition the cementite has the formula $Fe(Ni)_3C$.

6. The eutectoid ratio in these steels appears to lie at about 0.70 per cent. carbon, but in the rolled steels no free cementite shows until the carbon reaches about 1 per cent.

7. Nickel lowers the transformation points Ar3.2 and Ar1 about 20 degrees for every 1 per cent. of nickel.

8. The cementite of these steels is very liable to precipitate its carbon as "temper graphite."

Two new steamers are being built for the Transatlantic service of the Canadian Pacific Railway by the Fairfield Company of England, and the first will be launched in a few weeks. They will be named Empress of Britain and Empress of Ireland and will run between Montreal and Liverpool, but are built with a view to a possible transfer to the company's Pacific fleet. They are 550 feet long, 64 feet beam and of 14,500 tons, with twin screw balanced engines designed to give them a sea speed of 19 knots. The mail contract is now held by the Allan Line, as its two new turbine steamers, the Victoria and the Virginian, are faster than any of the present vessels of the Canadian Pacific Railway line, and the competition has led the latter company to improve its service.

Plans and estimates for including the Esopus watershed in the extension of the water supply sources of New York City have been laid before the Board of Estimate in the past week. The Commissioners and their engineers estimate that it will cost New York City $106,212,000 to develop a water supply of 250,000,000 gallons daily, including the cost of storage, reservoirs and aqueducts. This equipment could be enlarged to develop 500,000,000 gallons daily. For a filtration plant an additional estimate of $645,000 is made. The matter will be taken up when the annual budget is made, about November 1, and the approval of the State Water Commission will then be sought. The plans provide for a terminal distributing reservoir at Hill View, Yonkers, New York, and a storage reservoir at Kensico capable of supplying 500,000,000 gallons a day for 50 days in case of damage to the proposed aqueduct. A conduit with capacity to deliver 200,000,000 gallons a day to Brooklyn Borough and a pipe line to deliver 20,000,000 gallons a day to Richmond, 117 miles from the head of the aqueduct, are contemplated.

The modern pattern storage building is constructed with due regard to avoiding fire from any cause. One source of danger lies in the direct steam heating pipes which have so often formed a part of such structures. The Bullock Electric Mfg. Company, East Norwood, Ohio, has eliminated this risk by installing a complete hot air heating equipment furnished by the B. F. Sturtevant Company, Boston, Mass. All steel pipe is incased in a steel plate jacket and only moderately warm air is distributed throughout the building.

Solid, Flexible and Hollow Stay Bolts.

A paper read by John Livingstone before the New York Railroad Club, September 15, 1905, presents a very comprehensive inquiry into the quality and utility of the various kinds of stay bolts. The author enters quite extensively into the question of quality of iron in the manufacture of stay bolts. He then passes to the solid rigid stay bolt and gives the experience of railroads in their use as well as theoretical causes of their proving defective in service. With regard to flexible stay bolts he claims that the word "flexible" in its application to these products is a misnomer. He says: "The theory of the flexible stay bolt makers is in the claimed flexibility, or the imitation of flexibility, in the bolt by its alleged mechanical freedom to move in a sleeve, accommodating itself to the expansion and contraction induced by temperature; but the temperature is not uniform in the fire box or in the bolts and accordingly the expansion of the bolts is not uniform." Testimony from a number of railroad authorities is cited to show that stay bolts of this character do not fulfill the claims of their makers.

The Hollow Stay Bolt.

The hollow stay bolt is brought forward as meeting to a greater extent the requirements of railroad service than other forms of stay bolts now in use. An abstract of Mr. Livingstone's remarks on this subject is as follows:

The idea of a hollow stay bolt dates back about 30 years. In 1876 Mr. Huffsmith, who for 15 or more years has been superintendent of motive power for the International & Great Northern Railroad, stayed six engines with hollow stay bolts, made by drilling the holes through the center of the bolts with the unsuitable drills then in use, which added to the cost by many of the drills breaking. Mr. Tuggle stayed one engine with hollow stay bolts made in the same way. Mr. Briggs, master mechanic of the St. Louis & San Francisco, at Memphis, tried to make hollow stay bolts by one layer of pipe over another, and the same has been tried and is said to be on trial by others. I was also informed by a master mechanic on one of the railroads in Mexico, that when he was with the Pennsylvania Railroad about 20 years ago an engine had been stayed with bolts drilled through the center from end to end.

Those experimental tests by different men in different places, without any interposing agent or influence, for improvements in the staying of boilers, are evidence that there was a common feeling that the mechanical mind was reaching out to hollow stay bolts as the way to betterment in service in the fire boxes of locomotives, but that unsuitable drills, the breakage of drills and the time of drilling with unsuitable drills made the cost for hollow bolts made in that way too high to come into general use.

Some years after those experiments the manufacture of hollow stay bolts became one of the industries of the United States, and they were received with favor before the process of manufacture was perfected.

Perfection was never attained in improvements without disappointments, and the makers of hollow stay bolt iron were not immune from the vicissitudes in a business which was wholly new. Victims of work from a defect which irritated and no doubt caused some swearing to impress the defect on their minds made me aware of an old complaint—the manufacturer's misfortune; he paid the debt of enterprise. Breakage of stay bolts was then, is now, an every day occurrence, and they are renewed as a matter of course, without any malign memorizing of the particular stay bolts breaking. But the hollow stay bolt came on the scene as an improvement on the rigid stay bolt, and was a menace to the rigid stay bolt. Its said defect was therefore photographed; its manufacturer entombed it, but its menacer embalmed it. The embalmed mummy kept the complaint alive as if it were a thing of yesterday notwithstanding that 10 to 13 years have elapsed; sinister speech and photographs to mislead, not in the public interest, have been used to prejudice railroads.

I investigated and traced the cause of the complaint,

which my travel enables me to say is a complaint limited to very few in number out of all the mechanical men I have visited. The time of the cause of the complaint is variously stated at 10 to 13 years ago. Its origin was in material obtained under circumstances to justify high expectations, but it was found to be a combination of steel and iron, from which there was the natural consequence in the fact that steel and iron are separable at some temperatures of furnace heat.

Notwithstanding that there was irritation from that cause, I learned at the International Boiler Makers' Convention, and again at the Master Mechanics' Convention, my informant at one convention being a foreman boiler maker and at the other the assistant foreman boiler maker in railroad shops near New York, of a railroad which, for the complaint aforesaid, condemned the hollow stay bolt and discontinued its use, but not until after it had stayed the fire boxes of 10 engines. That was over 10 years ago, as my informants give it, and those 10 engines have been in service since, stayed then with the hollow stay bolt, and only this year one of the number is back into the shop for a new fire box.

At the International Boiler Makers' Convention a foreman boiler maker whose name has escaped me, said, "I put some hollow bolts into engines 15 years ago, and I believe they are there yet."

The hollow stay bolt is made from Swedish blooms and native charcoal iron worked together. After the prior stages of manufacture the iron is piled and again made into blooms, from which it is rolled into stay bolt iron. No coal is used in its several workings, no change is made in the raw material, and there should be no variation in the quality of the bars produced. It is seldom there is any change in the product, but there are risks—risks in the fallibility of man.

I happen to have before me seven tests from five laboratories. They are very close together, evidencing the uniformity of quality in the iron, their averages being as follows:

Tensile strength, pounds	50,166
Yield point, pounds	31,980
Elongation in 8 inches, per cent	31.8
Reduction of area, per cent	55.4

We learn by comparison. Compare those tests with one of the specifications furnished to purchasing agents as a basis for the purchases of iron for a railroad.

Tensile strength per square inch, pounds	48,000
Elongation in 8 inches, per cent	25

The above seven tests include tests on solid and hollow stay bolt iron, all of the same material, the different laboratories only fractionally different, each proving the other, and the whole proving the sameness of quality in the material. But in a vibration test of solid and hollow samples of the same material, the tests in each case on vibrations of 5-16 inch, the hollow sample endured 19.473 per cent. more vibrations than the solid. At shorter strokes, natural to the service in the fire box, the vibrations, if the mechanical conditions of construction were true, should continue during the life of the material, limited to its duration under the wear and tear of the service in the boiler. But the question is why did the hollow stay bolt material endure almost 20 per cent. more vibrations than the solid sample? Professor Maxwell of Cambridge says:

> Every hot body is in motion. Not the motion of the whole body in one direction. The motion we call heat, a motion of parts too small to be observed separately. The energy of a hot body must be energy arising from the motion of its parts.

Whether by hammering or by vibration, the particles are driven in upon one another, and the heat resulting from their compression produces expansion, which is resisted by the cooler exterior. That was the condition in the solid stay bolt sample. The hole through the center of the hollow stay bolt material was its relief to its particles under the severe vibrations. It was that relief which gave to the hollow stay bolt material the endurance to stand the 20 per cent. more vibrations than the solid sample of the same material endured.

That there is merit in a hole through the center of the stay bolt, I quote from Byrne his excerpt from Mallet:

> The maker of the forgings, after three failures, overcame the difficulty by making a cylindrical opening in the center, which allowed the interior of the forgings to cool as rapidly as the external ring, and which permitted the necessary contraction without producing fissures.

There is no illusion about a hollow stay bolt. The tensile strength is sufficient at all pressures in the boiler. Its yield point is on the average 63.75 per cent. of the tensile strength, with the elastic limit always safe for the reforming of the material after deformation by expansion. Its ductility is seen in its endurance of a reduction of area before yielding to breakage of, on the average, 55.4 per cent., then showing that it had elongated 31.8 per cent.

It has endured 5024 vibrations of 5-16 inch, against 4192 like vibrations in its like material and 2400 like vibrations in a highly refined coal smelted stay bolt iron.

The hole through the center is an always sure warner when stay bolts break in service; it calls for no stay bolt inspector, it is its own announcer of breakage, and never fills up with dirt. The pressure of the air from without, the suction of the air from within by the vacuum created in burning and the action of the exhaust are sure forces in keeping the hole through the center of the bolt always open. The concentrated velocity of the air through the hole in the center of the bolt moderates the molecular action in the stay bolt, tends to protect the end of the bolt from burning and tends to moderate the expansion of the bolt within the limits of the temperatures of the steam pressures in the boiler.

The hollow stay bolts should be used throughout with their ends open. I make this statement in the hope that it will reach some who have been closing the inside ends for one reason, and in the hope others will see it who have been closing the outer ends for some other reason. In both cases the reasons are merely fanciful.

In my reach of travel, from Canada to Mexico, I can conscientiously say, the weight of evidence is in favor of the hollow stay bolt.

A New Dunbar Furnace.—The Dunbar Furnace Company, Dunbar, Pa., has torn down its No. 2 furnace and is rebuilding it completely, the contract for the structural steel and plate work being in the hands of William B. Scaife & Sons Company, Pittsburgh, Pa. When finished the new furnace will be an 18 x 80 foot stack with four stoves. It will be equipped with skip hoist and charging arrangement, and there will be a concrete subway 12 feet wide, 10 feet high and about 1000 feet long under its entire stockhouse and ore yards for the assembling of material. No. 1 furnace of this company was rebuilt in 1901. The present furnace plant is the outgrowth of the old Union charcoal furnace, built near the present furnace site in 1796. Dunbar has thus been a continuous producer of pig iron for over 100 years.

British Pig Iron Output, First Half of 1905.—Statistics collected by the British Iron Trade Association show that the total production of pig iron in Great Britain for the first half of 1905 was 4,612,600 gross tons, which is considerably more than for any six months since 1900. If this rate were continued until the end of the year the output for 1905 would be 9,225,200 tons. This amounts to a rate of 680,542 tons a year in excess of the actual output for the year 1904. It is stated that the increase was largely in the minor iron producing districts. In the Cleveland district the increase was from 1,018,270 tons in the first half of 1904 to 1,130,498 in the first half of 1905. In Scotland the increase was from 515,000 to 670,400. No doubt the gamble in pig iron warrants which was under way in the earlier months of the year had to do with the increase in production.

The International Beam Syndicate has put up prices 2.5 shillings. It consists of German, French and Belgian producers, with headquarters at Duesseldorf. The allotment of the German works is 73.45 per cent., that of the Belgians 15.05 per cent., and that of the French 11.50 per cent.

Canadian Trade Topics.

Bounties Paid.

TORONTO, October 14, 1905.—An official statement shows that from June 30, 1898, until June 30 last, $5,702,967 was disbursed by the Dominion Government on account of bounties on iron and steel. In the last fiscal year the amount was $1,540,105, as compared with $908,962 in the next preceding fiscal year. Last year's payments were distributed as follows:

Pig iron	$624,670
Puddled bar	7,894
Steel ingots	614,433
Manufactures of steel	293,208

Of the total thus paid out $676,880 went to the Dominion Iron & Steel Company, and $404,956 to the Algoma Steel Company.

On other products bounties were paid out as follows in the last fiscal year:

Lead	$233,844
Lead exported for treatment	96,800
Binder twine	13,789
Crude petroleum	350,047

As the rate on crude petroleum is 1½ cents per gallon, the quantity produced in the twelvemonth was 52,507,050 gallons.

The question of continuing the bounties has been pressed on the Tariff Commission. In its hearings at Victoria, British Columbia, October 5, J. H. Lugrin made strong representations as to the need of the bounties being retained. He said that Vancouver Island has plenty of iron ore, and that a party of American capitalists is prepared to utilize it by manufacturing it into iron and steel in works to be erected on the coast. But this enterprise is dependent on the retention of the bounties. On Quatsino Sound, he said, there is all of the iron ore, limestone and coal required, and he maintained that iron can be produced more cheaply there than in Pittsburgh. Bounties, however, are needed to encourage capital. Mr. Lugrin was asked to obtain from his associates a distinct statement of the assistance that would suffice for them to go into the undertaking, and to say particularly if a $3 bounty on pig iron and nothing on steel would meet their wishes.

A Shipbuilding Bonus.

Another petition that was heard by the commissioners in Victoria was one for a bonus on ships. It was pointed out by the deputation who presented this request that it is now open to anybody to import a ship from Great Britain free of duty. Also any foreign ship that registers in a British country is free to take part in the coasting trade of Canada. American vessels have registered in Newfoundland and have thereby qualified themselves to carry between Canadian ports. It was shown, too, that Canadian shipbuilders have to pay a duty on their material in order that Canadian producers of such material may be protected. Shipbuilders' machinery is likewise taxed. To compensate Canadian shipbuilders for the disadvantage at which they are placed by these conditions the commissioners were asked to provide for a bonus of $10 per ton. Mr. Fielding reminded the deputation that the Atlantic and Great Lake shipbuilders of Canada met some time ago and decided on $5 as a fair bonus. The deputation was asked to send all the information collected on the subject to the Finance Minister for further examination.

Labor and the Tariff.

At its recent meeting in Toronto the Trades and Labor Congress of the Dominion appointed a tariff committee, which has just sent out a long circular to all organized labor bodies in the country, opposing any increase in duties. It arraigns manufacturers for antagonizing organized labor. Among other things the circular says:

> It is not thought desirable at the present time to make any pronouncement upon the relative merits of free trade and protection. Our position simply is that the tariff is now high enough.

American Stoves.

In a letter to the Toronto *Globe* Harold E. Copp of the Copp Stove Company, Port Arthur, makes the statement that American stoves are being sold at sacrifice prices in the Canadian West in spite of the antidumping duty. "For instance," he says, "a certain house in Minnesota is selling a cheap class of stove that weighs 70 pounds to houses in Winnipeg at $1.90, f.o.b. factory." He says that the Canadian stove manufacturer is suffering from grossly unfair American competition. To protect the former he suggests a specific duty in addition to the ad valorem duty.

Australia's Tariff.

The Australian Government his stiffened the duty on Canadian agricultural machinery. The ad valorem duty to which Canadian harvesters are subject is now to be levied on a valuation about 70 per cent. in excess of that at which they were formely entered. In its endeavors to get at the basis of cost the Commonwealth Government sought assistance from the Dominion Government, but the latter declined to furnish any information as to the probable worth of a Canadian harvester. This appears to have caused some offense at Melbourne. The large increase in the value for duty cannot but tell on the profits of the Australian business done by the Canadian manufacturers, as they have the largest share of the harvester trade in the Commonwealth. One of the elements in the dutiable price is the cost of internal transportation. The Australian customs collector is required to add to the price, f.o.b. at factory, the cost of carrying the shipment to the point at which it leaves Canada. This rule naturally influences the shippers to make the transit in Canada as short as possible. Rather than send his shipment by way of Vancouver, and thus make the internal freight increment to the dutiable price as large as possible, the Toronto manufacturer will be inclined to ship through Niagara. In so far as he does, he will, of course, favor American routes to Australia as again Canadian. This has brought a protest to the Dominion Government from the Canadian Pacific Railway Company, which asks why it should be discriminated against. The Dominion Government has asked the Australian Government to waive that requirement, pointing out that the steamship line from Vancouver to Sydney is jointly subsidized by Canada and Australia, and that this intraempire line of communication will suffer if the order is adhered to. The Australian Government replied to the effect that the rule must be maintained.

So far, however, the Canadian manufacturers favor the Canadian route the same as before, and this season their shipments to Australia have been heavier than ever. On the Miowera, which was to leave Vancouver for Sydney yesterday, there is 800 tons of agricultural machinery.

Freight Rates.

Wholesale hardware dealers in Quebec city maintain that the ocean steamship companies discriminate strongly in favor of Montreal. William Doyle of the former city received a 40-ton lot of galvanized iron goods from a house in Bristol, England. It was carried past to Montreal and then shipped back thence after some considerable delay. By the same vessel, it appears, a shipment of the same kind of material from the same Bristol house was brought to a large wholesale hardware house in Montreal. Mr. Doyle, it seems, received both bills of lading, and found that while he had to pay 12 shillings 6 pence per ton his competitor had to pay but 8 shillings 6 pence.

J. H. Ashdown, wholesale hardwareman and one of the leading business men in Winnipeg, appeared before the Railway Commission, which is sitting in Winnipeg now, to uphold his contention that the Canadian Freight Association treats Western merchants unfairly. He stated that while retailers in Eastern cities can replenish their stocks from the wholesale warehouses at any time, Western houses are obliged to carry large stocks. This necessity, he held, places them at the mercy of the railroads. These, he charged, deliver freight at their own convenience, hold it in yards till it pleases them to release it, and then make demurrage claims if the cars are not unloaded in the very shortest time. This state of affairs, he said, prevailed not only during the three months of the grain rush, but all the year round.

The Canadian Pacific Railway has reduced freights on all westward bound shipments by about 12 per cent.

The reduction became effective on the 12th inst. It is expected to help the Ontario and Quebec manufacturers in their competition with those of the United States for the trade of Western Canada.

The Steel Rail Trade.

Two thousand five hundred tons of steel rails have been ordered from the Algoma Steel Company by the York Radial Railway Company, whose system radiates from Toronto. The demand on account of electric railways is a rapidly growing one, as the mileage of these lines is increasing. The York Radial Company will require 2000 tons more very shortly. It uses 60-pound rails.

Since the opening of navigation last spring 50,000 tons of steel rails have been unloaded at the Canadian Pacific Railway Company's docks at Fort William. Ten thousand tons more are expected to be laid down at the same place for the company before the season closes. The 50,000 tons delivered came from the Algoma Steel Company's mill, and the 10,000 tons yet to come are to be from the United States.

On the 12th inst. the Dominion Iron & Steel Company's mill rolled 1100 tons of rails, the high record day's output up to that date. It has now about completed the Grand Trunk Company's 25,000-ton order, and the Intercolonial's 25,000-ton order is to be begun at once.

It has been stated by officials of the Dominion Iron & Steel Company that it has secured the Grand Trunk Pacific Railway Company's contract for $4,000,000 worth of rails. Delivery, it is said, is to be completed in five years. The billet mill of this company, which was closed down for repairs, has been busy since September 26.

Notes.

Metal roof manufacturers are opposed to the idea of a duty on tin plate, terne plate, Canada plate and sheet steel in favor of the Morrisburg industry.

The 17th inst. is the date fixed for the nomination of a new Reeve in Morrisburg, and the 24th for the day of the election. With a new Reeve in office it is expected the Council will push the former business so as to carry out the town's contract with the Canada Tin Plate & Sheet Steel Company.

A syndicate of Americans is negotiating with the town of Fort William for the obtaining of concessions to establish a steel plant in the town. A site and 500 feet of water front are asked. It is proposed to make rails and other rolled products.

The idea of establishing a second blast furnace in Port Arthur is being entertained by the company that is building there. C. A. C. J.

In many manufacturing plants it is now the common practice to prepare lists in the drafting room of the parts comprising a machine, giving at the same time the name, drawing number, pattern number, material, &c., for each piece and the number of pieces. The B. F. Sturtevant Company, Boston, Mass., was one of the first to introduce this system by the use of so-called "production lists" printed on thin paper, with the different items lettered in black ink, so that blue prints in any quantity can be made for distribution. These form the basis for production, casting, purchase and other orders. The original is retained as a permanent record of the details of each machine, simplifying reproduction and the filling of repair orders upon obsolete designs.

Long steam pipes are a noticeable feature of the anthracite coal district. It is not unusual to see radiating from a central boiler plant to neighboring mine workings several pipe lines as long as 1000 feet. The economy of this method of distribution is due to the very cheap cost of the fuel used as compared with the cost of boiler room labor and of boiler outfits. One steam line more than a mile in length is said to be in operation in the neighborhood of Scranton, while a large number are operated over distances of from 3000 to 4000 feet. In most cases these lines are lagged with asbestos or magnesia coverings.

The fifteenth annual convention of the National Association of Railway Bridge and Building Superintendents is being held in Pittsburgh this week. S. F. Patterson, Concord, N. H., is secretary. About 2000 delegates are expected to attend the convention.

Invisible Platinum Wire.

BY S. D. V. BURR.

It is a mistake to suppose that all the refinements in engineering practice have been confined to the last decade or two. Our fathers and grandfathers did some delicate work in their day and generation, and there certainly were mechanical heroes, in small things, before even their time. An item in a recent issue of *The Iron Age*, referring to wire only 0.0005 of an inch in diameter, calls to mind one instance which was considered quite wonderful.

Some thirty-five years ago the late Henry F. Read, of Brooklyn, inventor of the Gem water meter, made several yards of platinum wire so fine that when wound around a white card it could not be seen except by those having exceptionally good eyes. It could be felt, and the shadow cast by it upon the card could be seen, so that its presence was manifest. Its exact diameter was not known, and although this could easily have been calculated it was not thought necessary; the wire could not be seen, *ergo*, it must be mighty fine, and it certainly was fine enough for the use to which it was to be put. That was sufficient.

The manner of drawing the wire was exceedingly simple. A steel die was first made, the hole being as small as it could conveniently be drilled and polished. Diamonds and rubies were then used for wire drawing, but the steel was easier to handle and answered the purpose just as well. Platinum was then drawn through the die as a first step. A length of the platinum wire was then put in a tube of silver which was passed through the die. A length of the composite wire was again incased in silver and the drawing repeated. After the wire had been passed through the die a sufficient number of times the silver was removed with acid and the invisible platinum wire resulted. At first the drawing was done by hand, but the starts, stops and jerks of this method were found to have a tendency to break the wire, especially when it had become quite fine. This trouble was overcome by providing a little draw bench having a pinion and gear for doing the pulling; the strain was now constant and steady, yet even with this only comparatively short lengths could be drawn. A wire 3 feet long was thought to be a very successful performance.

The wire was intended for use in making the cross-wires in transits, telescopes and optical instruments of like character. The animal fibers employed for this purpose caused considerable inconvenience, principally for the reason that they were affected by slight changes in the humidity of the atmosphere. It was thought the metal would overcome these and other difficulties, but the wire itself possessed defects which were of a far more serious nature and prevented its employment for this purpose. It could be readily inserted and adjusted, and once placed in position it could be relied upon to stay there; but its disadvantages far more than counterbalanced these good points. The prohibitive defect arose from the fact that its surface was too bright. The instrument maker demanded a cross wire that was a dead black—one that was shiny would ruin the accuracy of his instrument. Fibers could be dyed; the metal could not be colored.

The wire manufacturer found he had produced an article which could not be used for the specific purpose for which it had been made, and for which there was no demand in any other direction. He also found that a comparatively few yards of wire would stock the market, as far as the instrument men were interested, and that there was no other demand for invisible wire. He had not produced a commercial article, but he had made a beautiful experiment. At the present time wire of almost any degree of minuteness, visible or invisible, would be made if it were needed. Archimedes only required a fulcrum upon which to rest his lever; all the wire drawer would need would be a die with a hole of the right size in it, and a swaging machine to reduce the end of the wire so that it would enter the hole.

Ore Properties Sold to Consumers.

DULUTH, Minn., October 14, 1905.—An important sale of Mesaba ore property has been made to the Cherry Valley Iron Company, which secures what gives it practical control of the La Rue mine, near Nashwauk, in section 32-57-22. La Rue contains about 5,000,000 tons of excellent Bessemer ore, running 60 per cent. in iron, 0.045 per cent. phosphorus and about 8 per cent. moisture. It is developed for open pit mining for some year to come, but will have to get underground after a while. A considerable area of ore is now uncovered and the milling process has been adopted. The interest sold is that of Joseph Sellwood of Duluth, which is probably about 25 per cent., and the sale was at the rate of $1,000,000 for the entire lease. La Rue is mined on a royalty of 20 cents a ton and is an annual minimum of 100,000 tons. The fee is in the hands of the Mississippi Land Company, of which Messrs. Weyerhaeuser and associated lumbermen are stockholders. Another independent iron company, the Wheeling, has a small interest in this mine, but by virtue of its connections with outside tonnage the Cherry Valley can control the property. This gives that company three Mesaba mines—namely, the Croxton and La Rue, both of which are opened and operating, and the Jeffrey, south of Mountain Iron, an undeveloped property of more or less value. Mr. Sellwood has within the year made sales of all his operating Mesaba interests aside from two small properties, Morrow and Cass.

It is understood that a sale of the Columbia property east of Hibbing is now pending and that other sales to furnace and steel making interests are in the air. The Great Northern Railroad has been buying a few mines of late and has within the past few weeks closed up two excellent properties. The chief significance of the sale of La Rue lies in the fact that it practically cleans up the important Sellwood Bessemer ores, which were among the very largest merchant mines, and takes all these properties out of the market upon which the outside furnaceman can depend for a supply, for none of these mines will now sell any ore.

Railroad and Mine Equipment Orders.

Orders for 1906 equipment have been made by several of the upper lake ore railroads. These include so far 1350 steel ore cars and 22 locomotives. Of the cars the Duluth, Missabe & Northern has ordered 750, the Duluth & Iron Range 500 and the Lake Superior & Ishpeming 100. These are all to be built by the Pressed Steel Car Company. The first mentioned road will have six consolidation type freight and two passenger locomotives, the former from the American Locomotive Company, the latter from the Baldwin Locomotive Works. The second road will have six consolidation freights and four switch engines, all Baldwins. The third road is to have two consolidation road engines. These freight engines are of 22 x 28 cylinders and of about 170,000 pounds on the drivers. Orders of more or less size are expected to come from the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul, though the latter may build in its own shops.

The Oliver Iron Mining Company yesterday gave orders to the General Electric Company, through the latter's Duluth office, for a 100-kw. direct connected generator and 14 x 30 Corliss engine to handle the underground haulage. A duplicate order was given for the Fayal mine. These are equipments referred to as probable in recent correspondence. It is quite likely that several more of similar type will be installed at other mines of the same company in the near future.

Effect of the Heavy Ore Movement.

Large stock piles that had accumulated at and near Ishpeming have been about cleared up. Many of them were the growth of several years, some of eight or ten, and their depletion is the cause of much comment and the basis of many hopes for the future. These piles were mostly ores of a character that could not be shipped profitably until now, as the demand did not extend to them. In Ishpeming there will be no ore in stock at the close of navigation unless it be a small part of the Cliffs shaft hard non-Bessemer, which has been on hand for years. This pile is now fast diminishing and may be all gone. At Negaunee there is nothing in stock that will not be cleared out by the close of the year. At Champion there are something like 170,000 tons of hard ore, from which shipments are slowly made. The mine is being overhauled in readiness for resumption, but there is little probability that it can be started up this year; the overhauling is along the line of the Oliver Iron Mining Company's policy of having everything in readiness for the future. This mine makes much hard ore in lumps, which seems to be more in demand than formerly. It has a crusher, but this is not likely to be used again, as what ore is to be broken will be treated at the company's central plant at Escanaba terminals. There are no other parts of the Marquette district where ore is in stock. Preparations for a large output during the coming winter are under way and stock piling grounds are being graded and enlarged at many points.

On the Menominee, too, there will be bigger stocking grounds than have ever been seen in the district. In the Crystal Falls section this is especially true. During the past year or two the idea of stocking ore underground during the winter has grown, but despite this there is an increase above ground, as noted. It is probable that very large piles will be at Tobin, Great Western and Crystal Falls mines next spring.

Deeper Mining to Be Done.

On the Gogebic the Oliver Iron Mining Company alone has 18 operating shafts and other companies have in all 31 more. This is a greater number than in the history of the range. Deeper mining is the rule, and the Newport has been most active in getting down, having opened large bodies of high grade ores as deep as 1900 and 2000 feet. This is at the east end of the mine in the Bonnie shafts. The Newport has been installing fine surface equipment and is now fitted out with what is generally said to be as fine as anything on the range. On the Wisconsin end of the range half a dozen old and long abandoned or semi-idle properties are being unwatered, reopened and explored, and the prospects are for important discoveries. This work is in the hands of large consuming companies which are after ores for their own use and they will spare neither pains nor funds to find what they require. There is also much activity east of Bessemer, in the district between the old Colby and the west shores of Sunday Lake, and much in the way of enlarged ore bodies has been already found there, while prospects are for still more important discoveries. Some work is in progress east of the Sunday Lake group. Sunday Lake and Brotherton mines, now belonging to the Lackawanna Company, are being developed largely for a longer and bigger career than it looked as though they were capable of, and the present owner is said to be more than satisfied with its purchase. These ores are so low in prosphorus—about 0.026 per cent.—that they will carry a large amount of 0.050 and thereabouts and add materially to the value of ores of other ranges that may be mixed with them.

Several properties on the Western Mesaba, under option to the Oliver Iron Mining Company and other concerns, have been taken over, and the tonnage exposed in that district is increasing somewhat. Many drills are working there this fall. A good find has been made three or four miles east of the Mississippi River, on land optioned to the Oliver Company. At Biwabik mine a few days ago a total of 12,500 tons was loaded during one ten-hour shift, three shovels in ore, none of them busy all the time. This is a high record, possibly the best that has been made under similar conditions.

John T. Jones, at the Old Saginaw, near Norway, is developing what may prove to be a large mine. He has cut a considerable distance in ore running 56 per cent. iron and 0.013 phosphorus, and believes it to continue aross the property. If true, this will be a great mine. He and the late P. L. Kimberley took the old mine last spring with the idea of mining out the pillars and cleaning up the workings. In doing this they uncovered a small ore lens which was followed. They later determined to do some exploration in a hitherto unworked part of the property, and after they had about concluded to quit this new lens was found. The shaft is now 350 feet deep. Some mining will be carried on this fall and two cargoes will be shipped, if not more. D. E. W.

Customs Decisions.

Steel Cylinders for Holding Gas.

The Treasury Department has determined to exact a duty of 45 per cent. on steel cylinders designed for holding gas under pressure. It appears that the customs authorities at New York have been uncertain as to what classification to give the cylinders. Collector Stranahan has been holding a consignment of the tubes at the appraiser's warehouse pending a settlement of the case. Special Treasury Agent Clayton recently sent a letter to Secretary Shaw in which he reported that Appraiser Whitehead was of the opinion that the cylinders should be classified as manufactures of metal at the rate of 45 per cent., but that he felt constrained, in view of the decision of the United States Circuit Court of Appeals in the case of Downing & Co., to return the merchandise as "welded steel cylinders and tubes," at the rate of 35 per cent. The special agent further reported that, as the appraiser, in his advisory classification, followed a decision of the court, Collector Stranahan was adverse to liquidating the entry at a different rate in the absence of a suggestion from the Treasury Department to that effect. In order that the question may be judicially determined James B. Reynolds, Assistant Secretary of the Treasury, has sent the following letter to the collector:

It is clear that the merchandise, the subject of the decision of the United States court, which consists of so-called steel cylinders designed for holding gas under pressure, from 5 to 18 feet in length and 4 to 6 inches in diameter, closed at both ends, with the exception of an outlet at one end, was essentially different from the merchandise under consideration, and it is difficult to conceive such merchandise being regarded as "tubes." As the Department has no information before it that such is its commercial designation, you are instructed to classify these cylinders under paragraph 193 of the existing tariff act at the rate of 45 per cent. to the end that this question may be passed upon by the courts.

The custom house officers decline to say who is the owner of the cylinders, but this information will probably become public property as soon as the test case is fairly before the Board of United States General Appraisers for adjudication. The importers, it is said, will make a strong effort to prove to the board, and, if necessary, to the Federal courts, that the merchandise is properly dutiable at only 35 per cent.

Fish Hooks Made of Wire.

In a decision written by I. F. Fischer the Board of United States General Appraisers has partially sustained claims filed by O. G. Hempstead & Son, Philadelphia, regarding the rates of duty applicable to fish hooks made of round steel wire. Duty was assessed on the merchandise at the rate of 40 per cent. and 1¼ cents per pound, under the provision in the tariff for articles manufactured from wire valued at more than 4 cents a pound. The claim of the importers was that the wire used in the manufacture of the hooks is valued at less than 4 cents per pound, and that consequently they are properly dutiable at the various specific rates provided in the first part of the paragraph, according to the gauge of the wire, instead of at the ad valorem rate referred to. The board finds that some of the hooks were invoiced from the factory of W. Woodfield & Sons, Redditch, and are made from wire valued at less than 4 cents per pound, as claimed by the importers. The board upholds the right of the importers to bring in the latter class of hooks at the lower rate, but the remainder of the consignment must stand the higher duties originally assessed by the collector of customs.

Floats and Fish Hooks.

On October 11 the board denied claims filed by Wilfred Schade & Co., St. Louis, Mo., regarding the customs classification of so-called porcupine quill floats and fish hooks. Duty was levied upon the hooks at the rate of 40 per cent and 1¼ cents per pound, while the reports were returned for duty as manufactures of metal, with duty at the rate of 45 per cent. Several claims were made by the importing firm, but none of them was deemed of merit by the reviewing tribunal, which affirmed the collector's assessment.

Lace Curtain Machines.

After the taking of much testimony the Board of General Appraisers on October 11 returned a verdict against John Bromley & Sons, Philadelphia, in the firm's suit for a reduction of duties on parts of lace curtain machines. The Treasury officials considered that the parts came within the meaning of the provision in the tariff law for manufactures of metal and were therefore assessable at 45 per cent. It was maintained by the importers that the articles were castings, and as such subject to duty at only 3-10 cent per pound. It appeared from the evidence that the articles are made of cast iron and that after they were cast holes were drilled in them and they were to some extent chiseled to fit them for the machines into which they were to be incorporated. In overruling the protest the board says that the word "castings" in the trade does not include articles made by the casting process which have been advanced in condition by work bestowed on them after being cast.

Metal Charms and Ornaments.

In a decision by General Appraiser Sharretts the board overruled a protest filed by Wells, Fargo & Co. relative to the customs classification of charms made of base metal in imitation of albums. They were assessed for duty at 45 per cent. as manufactures of metal, and were claimed to be dutiable at the rate provided in the tariff law for albums. In another decision Mr. Sharretts holds that various millinery ornaments imported by the Theodore Ascher Company, Chicago, are dutiable as claimed under the provision in the tariff for metals. The collector's classification as jewelry at 60 per cent. was reversed.

The board has overruled claims filed by the following: Charles G. Eckstein, New York, iron grinding disks; H. & A. Allen, Boston, iron sand, and F. B. Vandegrift & Co., Philadelphia, thermit.

Specifications for Cast Iron Car Wheels.

In a communication to the *Railroad Gazette* J. W. Henderson of Bellevue, Pa., characterizes as unjust the practice under which an inspector of car wheels may reject an entire lot if one wheel out of 100 is not up to the letter of the specifications. He adds that to increase the severity of the tests as proposed and thus give greater opportunity for penalties by rejection will still further retard the natural development of the cast iron car wheel. The writer contends that improvements in the design, strength and wearing qualities of cast iron wheels have nearly always kept abreast of the demand, and affirms that this will continue in even greater measure "if the railroads will extend to the manufacturers more co-operation and justice." He believes that specifications for the purchase and tests of cast iron car wheels should be drawn up by a committee composed of an equal number of railroad representatives and cast iron car wheel makers; a two-thirds vote to decide each proposition. In conclusion the writer says: "A low chilled wheel is not necessarily a strong one nor a high chilled wheel a weak one. A 'poor' iron with proper foundry conditions will produce a better wheel than the very best high grade charcoal irons will make with bad foundry practice. Having chosen specifications that amply safeguard the interests of a railroad without injustice to the manufacturers, the railroads should see to it that the purchasing departments encourage those makers furnishing wheels of the best quality."

Referring to a recent statement that the first all steel railway car built in England was brought before the public in September, the general manager of the London Central Railway writes the London *Times* saying that his road has had six steel cars in use for more than two years. They are built with steel framing, steel plate outside and steel and asbestos roofing. They are lighter, stronger and roomier than the wooden cars, though having the same external dimensions. Mr. Cunningham says that the operation of these cars has been entirely satisfactory. He has been experimenting with sheet aluminum for the interior panels of cars and finds it quite satisfactory. An entire train is now fitted with these aluminum panels.

THE IRON AGE

1855—1905.

New York, Thursday, October 19, 1905.

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RICHARD R. WILLIAMS. . . . . HARDWARE EDITOR

Cities Competing for Skilled Labor.

A time may come when the labor bureau idea will have developed into a clearing house of labor which will obviate the almost fierce striving of the present time to secure enough of good men, especially first-class mechanics, to meet the volume of business which the manufacturers in metal lines have in hand. Were it not for its serious side this condition would be almost amusing. Cities and towns are bidding against one another, sending emissaries to offer inducements in the way of higher wages. For instance, Bridgeport, Conn., has sent to Worcester, Mass., for workmen, but Worcester has sent to Bridgeport, with a result that each city has obtained some men from the other, but probably neither has any more skilled workmen than before the exchange was made. Each has succeeded in bulling the labor market in the other city, every bid helping toward a higher wage scale. Machine shops of the same city are literally swapping men without realizing it, hiring from one another at an advance in wages. There seems to be no present remedy. An employer must have more good men and they are sought regardless of business or personal friendship between manufacturers. Many works that would be operating with full night shifts find it impossible to do so because of the inability to get the necessary number of competent men. Some shops are running extra hours, paying proportionately for their labor. Thousands of high class machinists and mechanics of other trades could be given employment in New England alone without materially affecting the situation. In other sections of the country the demand is fully as great, and occasionally the stringency of the labor market is even more marked.

In connection with the general subject of scarcity of labor Bridgeport has an interesting instance in its foundry business. The molders' union made a demand in the few union foundries of the city for an increase of 25 cents a day. The minimum wage was affected, for this increase would change the figures from $2.75 to $3 for the molders and from $2.50 to $2.75 for the core makers. One of the foundries has granted the increase. But that it was a union demand carried no weight. The same increase would have been granted had the men asked for it as individuals, and as a matter of fact the men of the nonunion foundries have fared probably as well to date, for it has been necessary to increase the wages of good molders in order to keep them, advances to the most skilled men naturally coming sooner than to those earning only the minimum. And many employers in this and other lines are contented to see wages increase in such times as these, both as a precaution and as a matter of principle, even if the danger of losing men has not arisen. It must be added that this feeling exists among owners of nonunion establishments much more often than in union shops and factories. The whole present condition illustrates the fact, which unions are apt to ignore, that labor has a market price, which price is governed by the condition of their employer's business. If he is forced to pay too high wages when margins are small and business is light he cannot succeed and his men will suffer. If on the other hand he is permitted to regulate his wage schedule, or if conditions are permitted to regulate it for him, his employees will receive what they are worth, which very often is more than the union can get for them.

Features of the Pig Iron Situation.

A significant feature of the blast furnace statistics for September, published in our issue of last week, is that the furnaces of the steel companies were producing in that month at a rate greater than in any month of the year, while the merchant furnaces did not reach their average output for the nine months of this year. While the May output of the steel company furnaces exceeded that of September, May was a month of 31 days. These furnaces produced in September at a rate that would have yielded 1,304 100 tons in 31 days, as against 1,287,438 tons for May. Moreover, two important furnaces in the Pittsburgh district now working normally made a small product in September, so that that district dropped nearly 40,000 tons below its output in August. All indications now are for a record production in October, a consummation that will be welcomed by the entire trade for the influence it will exert in restraining any tendency to an over-rapid advance in the price of pig iron. However, it is to be noted that in contrast with the steel company furnaces the merchant furnaces not only fell below, in September, their output in August, but did not increase their rate of production over that of August, a month of 31 days.

While the condition of furnace stocks is not accurately known, the inference from the increased activity of foundries is that merchant furnaces must increase their output or draw upon their stocks to take care of the larger demands that are now being made upon them as the result of the buying movement of July. Another fact is to be taken into consideration in connection with the showing made by the figures below: Merchant furnaces in the past four months have not reached their average output for the preceding five months of this year. A further fact in this connection is that while practically none of the merchant furnace output, apart from some basic iron, went to steel companies in the first seven months of this year, a round tonnage has gone into steel in the past two months, and more than 50,000 tons a month of Bessemer iron alone will be so required for some months to come. In the table below the production of the steel companies, month by month this year, is given, as reported to *The Iron Age*, together with the production of coke and anthracite pig iron by merchant furnaces. For comparison with last month the figures for September, 1904, are given, together with average production in the second half of 1904 and the average for the first nine months of 1905:

Production of Steel Companies and Merchant Furnaces, Gross Tons.

	Steel companies.	Merchant. furnaces.	Total
January, 1905	1,129,042	652,805	1.781,847
February	1,027,937	569,406	1.597,343
March	1,232,255	704,009	1,936.264
April	1,222,710	699,331	1,922,041
May	1,287,438	676,279	1,963,717
June	1,149,404	643,885	1,793.289
July	1,114,409	627,526	1,741,935
August	1,186.050	657,623	1.843,673
September, 1905	1,262,033	636,840	1,898,873
September, 1904	936,494	416,183	1,352,677
Average second half 1904	888,771	476,162	1,364,933
Average nine months of 1905	1,179,031	651,967	1,830,998

The conditions under which the upward movement in pig iron took place, that was well under way at this time

last year, were different in several particulars from those existing to-day. Then the iron trade was just shaking off the depressing influences of months. Southern foundry iron that had been $9 at Birmingham in the early summer of 1904 had advanced until $11 was squarely reached in the third week of October, and $12 in early November. Production was stimulated, and while the merchant furnaces produced an average of but 476,162 tons of pig iron in the second half of 1904, the October, November and December records were 483,823, 524,221 and 596,166 tons, respectively. Strange as it may seem, the average production of merchant furnaces for the nine months of this year has been only 22 per cent. more than the average for the last three months of 1904.

The cost of raw materials to-day and their prospective cost present more contrasts with those of one year ago than do market prices and figures of production. On Lake Superior ores and Connellsville coke the comparison is about as follows: One year ago old range non-Bessemers sold at $2.65 at Lake Erie ports, and Mesaba non-Bessemers at $2.50, against $3.35 and $3.20 respectively to-day. On Bessemer ores the figures were $3.25 to $3.35 for old range and $2.75 to $3 for Mesaba last year, as against $3.85 to $4 and $3.65 to $3.75 respectively to-day. In October last year Connellsville coke, deliveries to the end of the year, sold at $1.40, while $1.50 was asked for the first half of 1905. Recently contracts for the first half of 1906 were made at $2.60 to $2.75. For Lake Superior ores for 1906 an addition of 25 to 50 cents is expected to be made to the above figures for this year.

It may fairly be concluded, in view of the data we have presented, and the vastly improved condition of the country industrially and financially in the past year, that the pig iron market has been maintained on a most conservative basis under the buying movement of recent weeks.

A Waste of Machinists' Wages.

Deep significance can be read in the financial report of the International Association of Machinists, made at the recent annual meeting at Boston, which showed that during the year ending June 30, more than $380,000 was expended for salaries and other expenses and for strike benefits. To any one who has followed the course of unionism among the machinists it is apparent that but little has been accomplished during the year in forcing employers by means of strikes to concede recognition of the union or shorter hours or increased wages. In isolated cases a lack of co-operation among employers or some other local cause has resulted in concessions, but as compared with previous years little was accomplished by strikes and, moreover, little was attempted. Yet the International Association of Machinists paid out $275,000 for strike benefits, salaries of officers and agents and general expenses, and individual locals expended $107,000 more, making a sum total which is astounding considering the purpose, the results and the source of money supply, namely, assessments paid by members. The great machinists' strike was in 1902. Many important manufacturing centers were seriously affected. Thousands of workmen were out, and strike benefits were paid them. Yet in that year, according to the records of the International Association, only about $169,000 was expended, much less than one-half the amount of the past year. Various elements must be taken into consideration in getting at the reason for this. But it is certain that the comparison means that strikes are much more expensive to the union than formerly, and no one will doubt that a great reason for this is that employers of labor have more backbone and are better united in their resolution not to be dictated to. Probably the expense item of the International Association, apart from strike benefits, is much larger than in past years. It probably costs a good deal more to interest workmen in the establishment of new locals and in the attempted resurrection of those which have fallen into decay through lack of interest and sympathy. The salary lists are doubtless larger and longer. The association realizes that expenses must grow, as is evidenced by the vote to increase the monthly assessment of members from 75 cents to $1.

Extravagant Predictions of Ore Shipments.

Iron ore shipments from the upper lakes are fast drawing to a close for this year, and it is probable that the estimated total of 30,000,000 tons will be exceeded by from 5 to 8 per cent. Up to this time the two Minnesota railroads under control of the United States Steel Corporation have shipped about 13,500,000 tons, most of which was for the corporation. Both roads have the remaining six to eight weeks of the season very well filled, according to the schedules under which they are operating. It will take about 2,500,000 tons from Minnesota to bring that State's shipments to 20,000,000 tons, and a considerable share of this is now in transit between mines and vessels. It is quite possible that Minnesota mines may have a gross business for the year materially in excess of that amount.

The prediction has been general for a year or two that in a comparatively brief period there will be annual shipments of ore from Lake Superior amounting to 50,000,000 tons. The history of the trade and the growth of business of recent years would apparently bear out this assertion. The records of lake mines show a decennial increase in shipments of about 300 per cent., this running along with reasonable closeness from the beginning to the close of 1905. If any such increase could be expected in future, the estimate of 50,000,000 tons for four or five years hence is not an exaggerated one. But things in the iron trade are not as they have been, and while increasing shipments are to be expected it is reasonable to look for a reduction in the rate of increase.

Mines are becoming more and more concentrated in the hands of consuming companies. These companies are buying ores for their own use and as a safeguard for the future, and they do not mine for the open market. Our Duluth correspondence of this week gives evidence of this increasing concentration. It has been going on steadily, and it is probable that very few, aside from those directly in touch with the industry, have any accurate idea of the present situation.

An increase in ore shipments to 50,000,000 tons means virtually the doubling of the present rate of pig iron production, for furnaces are now running at a higher rate than is probable for a long period. During the latter half of 1903 and the early months of 1904 many of the blast furnaces of the country were idle, but they were all put in first-class condition for a larger output later. They are now running up to nearly 100 per cent. of their capacity. It is not reasonable that they can so continue for any long period of time, and the present rate of smelting is, therefore, greater than normal at the present price level for the furnaces now built. The question is, who will double the effective blast furnaces in the next several years? Not the United States Steel Corporation. Even though it has great ore reserves, 25,000,000 tons a

year from such reserves is a rapid rate of exhaustion, and it need not be expected that the corporation will part with its ores on the low price basis that has heretofore accompanied the maximum use of steel to the displacement of other material. The building of plant promiscuously under individual initiative, and on the expectation that plenty of low priced ore could be had in the open market, was characteristic of a period which the iron trade has left behind. The stage in the development of the business has been practically reached where the comparatively few owners of the Lake Superior deposits have to consider, in connection with the erection of new furnaces and steel works, whether they shall seek to maintain their reserves for, say, 40 years, and in doing so maintain the price of iron and steel, rather than to exhaust their ores in half as many years and by so doing keep prices at a lower and less profitable level. Of course the steel corporation will build more furnaces, and very likely it will shortly be buying some of those belonging to such iron makers as did not look far enough ahead to buy ores when they were to be had at low prices and of good qualities. The independent furnace man who secures his ores in the open market will not build many more furnaces. His day, in fact, is already gone. He will be able to buy ore for a comparatively short while and is at the mercy of the sellers. Steel companies aside from the large corporation who, like it, own ore supplies, are in its position, accentuated by the fact that their reserves are comparatively less than the corporation's. They are not the ones to exhaust themselves prematurely by rapid depletion of ores in the ground.

All this naturally presupposes that no other great iron ranges so conveniently located and presenting the advantages of the Mesaba are to be discovered. No man can say that this will not happen, but the probabilities are all one way. Unquestionably there are great areas around Lake Superior that may contain iron ore in quantity. Several such possible districts are now known. But all of them present some objectionable characteristics and none is now being exploited to any considerable extent.

It is quite probable that the per capita consumption of iron and steel may not increase so fast in the United States as it has during recent years through purely natural causes that are not far to seek. There now seems to be no doubt of higher prices for ore the coming year, and the restraint prosperity ultimately puts upon consumption, of which this is but an item, may tend to curtail still further the ratio of growth. The day of 50,000,000 tons a year from Lake Superior mines may be much more distant than optimists consider.

In a former editorial mention was made of a tendency of newspapers to make unwarranted declarations concerning matters with which the writers are not conversant. The daily newspaper man generally is a jack of all trades but a specialist at none, hence to be accurate he should have authority for his statements and not draw on his imagination. There is a peculiar magic about print that carries conviction. The average person believes what he reads unquestioningly even without knowing the writer, and any contradictions offered verbally by experts are impotent. Here is a sample of how much one space writer knows of steam boilers, quoted from an account of one newly invented: "It is well known that in ordinary boilers the fire heats but one end or side of the boiler and the water can heat up but gradually." Evidently the writer's experience is limited to cooking utensils.

CORRESPONDENCE.

The Increase in Blast Furnace Outputs.

To the Editor: Referring to an article on blast furnace outputs in your issue of September 7, I will take the opportunity to make some remarks. This article states correctly that the production of individual blast furnaces in various countries was much less before the year 1870 than it is at the present time.

It was at the end of the 60's that the cinder tap was invented by Fritz W. Luermann of Berlin, when he was managing director of the Georg Marien Iron Works near Osnabruck in the Province of Hanover. This Luermann cinder tap is now in use in all the blast furnaces of the world. By its means there was abolished the fore hearth of the blast furnace, which is now hardly known, but was at that time considered necessary.

The former construction necessitated a great deal of work every time the furnace was tapped when it went hot; but when it went cold the fore hearth used to become stopped up. All the slag produced in the furnace passed through this fore hearth on the principle of communicating pipes. According to this the pressure of the blast required for the combustion of the fuel was dependent on the hight of the liquid slag in the fore hearth, as it formed one of the communicating chambers. When it occurred that the pressure of the blast exceeded the pressure corresponding to the level of the liquid slag the contents of the fore hearth were blown out and the blast had to be checked in order to bring the fore hearth into working order. The pressure of the blast before the invention of the Luermann cinder tap could not therefore exceed 2½ to 3 pounds per square inch, whereas now after the adoption of this invention the pressure of 5 to 20 pounds per square inch is in general use.

All repairs and interruptions in the working of the furnace which have been caused by the fore hearth are now avoided by means of this cinder tap. The increased working hours obtained by this means and the higher pressure of the blast, which is six to seven times above that in use before 1870, explain in a very simple manner by what means the larger production of blast furnaces has now become possible. The greatest output in Germany is that of the United Collieries—Deutsche Kaiser—in Bruckhausen in Rhenish Prussia, which is 1700 tons for all four furnaces daily.

FRITZ W. LUERMANN.

BERLIN, GERMANY, September 30, 1905.

Working Submarine Iron Ores in Newfoundland.—The Nova Scotia Steel & Coal Company of New Glasgow, Nova Scotia, acquired some time ago four and one-half square miles of submarine iron ore areas to the north of Belle Isle, Newfoundland. It has been found that the Wabana deposits from which the Dominion Iron & Steel Company and the Nova Scotia Steel & Coal Company have been drawing continue to the north under the sea. The Nova Scotia Steel & Coal Company is now mining ore in its Wabana areas at or below the sea level, and it has found that the ore at that point is of the full thickness of that worked on the land areas and of equal analysis. The company believes it is justified in assuming that a large body of ore exists in the submarine areas and estimates the quantity at 100,000,000 tons. It is believed that the cost of winning this ore will exceed by only a few cents per ton the cost of underground mining on the land. From the character of the roof and overlying strata no serious mining or engineering difficulties are anticipated.

The corporation of the Massachusetts Institute of Technology has voted to withdraw from the proposed merger with Harvard University. The question was practically settled when the Supreme Court of Massachusetts decided that the institute could not legally dispose of its real estate in Boston upon which its buildings stand, whereas one of the important conditions of the merger was that the institute establish a new home for itself on the Charles River opposite the university. This final action again raises the question of what Harvard will do with the Mackay millions which were left for the purpose of establishing an engineering school along the general lines of the modern polytechnic institute.

OBITUARY.

H. WINFIELD WYMAN.

Horace Winfield Wyman, of the firm of Wyman & Gordon, Worcester, Mass., died October 11, after a three weeks' illness of typhoid fever of a very severe type. He was 44 years of age, having been born in Worcester, May 30, 1861. Mr. Wyman was the only son of Horace Wyman, for many years associated with the late George Crompton in the Crompton Loom Works, and at present consulting engineer of the Crompton & Knowles Loom Works. He received his early education in the Worcester public schools and at the Worcester Academy, and entered the Worcester Polytechnic Institute with the class of 1881, but on account of trouble with his eyes graduated in 1882, taking his degree of bachelor of science in the department of mechanical engineering.

In 1883 Mr. Wyman formed a partnership with Lyman F. Gordon, who had graduated from the same institution in 1881, to engage in the manufacture of drop forgings, a product which was then in its comparative infancy. The firm made its start in a small building on Bradley street, Worcester, occupying two rooms, one as the forge shop, the other for machine work. From this modest beginning the business grew to large proportions, until it now has a large plant in Worcester, together with branch works at Cleveland, which were established in 1903 to take care of the Western trade. The firm is one of the best known and one of the most important in its line in the country, having won a high reputation among users of drop forgings. Mr. Wyman and his partner, Mr. Gordon, worked out together the development of both the manufacturing and office ends of the business, theirs being a singularly happy and well balanced association, never requiring that either should specialize exclusively in any one department of the work. Their intimacy had been lifelong. Their fathers have been closely associated in the Crompton Loom Works for 45 years. As children the two sons began their school life together on the same day, and they continued as classmates through the public schools and the Academy and in the Polytechnic until the time when Mr. Wyman's eyes compelled him to rest for a year. The close co-operation of their partnership was consequently founded upon an unusual intimacy.

H. WINFIELD WYMAN.

Mr. Wyman combined with a keen, well developed business instinct a strongly inventive and creative mechanical mind, which was of great value in developing new lines of products and the processes required to bring them to the necessarily high standard of excellence. His inventions were many and extended beyond the drop forging business into textile machinery, and several important patents were issued to him which are now embodied in high grade weaving machinery. As a young man he invented a quick action vise which is extensively known in the trade, and which is a part of the equipment of a great many of the technical schools of this country and abroad. He inherited this inventive trait from his father, whose name is famous as an inventor of weaving machinery. The paternal inheritance included also a pronounced bent for business, for Mr. Wyman, Sr., was a very important factor in the building up of the Crompton Loom Works, having been general manager of the business for Mr. Crompton and on the latter's death and the subsequent incorporation of the business, becoming vice-president and general manager.

The deceased was a member of the American Society of Mechanical Engineers, the Iron and Steel Institute, the Engineers' Club, New York; the Union Club, Boston; the Union and Century Clubs, Cleveland, and the Worcester Club, Tatnuck Country Club and Grafton Country Club of his home city. He was a trustee of the Worcester County Institution for Savings. He was for several years president of the Alumni Association of the Worcester Polytechnic Institute. His was a nature which won to him a wide circle of friends in social life and among those with whom he came in contact in business not only in this country but abroad, where he traveled much in the interests of his business. He is survived by Mrs. Wyman, a son, Horace, and two daughters.

HARRY SMITH SPENCER, one of the great designers of the J. A. Fay & Egan Company, manufacturers of wood working machinery, died suddenly at his home in Cincinnati, August 19. The company states that while Mr. Spencer was not exactly its head man he was tending that way very much. He had been brought up in the company's service, knew all its old and new pattern drawings, and his 20 years' experience had made his services invaluble. President Thomas P. Egan says, regarding Mr. Spencer's ability, "There was no man his equal in the United States or we would immediately hire him. Designers of his caliber are scarce, as his ability amounted to absolute genius."

BEN OTT, proprietor of the Wisconsin Iron Works, La Crosse, Wis., died October 2, after a very short illness, aged 69 years. He was born in Bavaria and was taken by his parents to Milwaukee, Wis., when five years of age. He became an expert machinist, working in various shops in Dubuque, Iowa, and La Crosse, Wis. The business with which he was connected at the time of his death was started under the name of Thornely & Ott, but Mr. Ott subsequently bought out his partner's interest. He was an inventor of national reputation. In 1867 he invented the twine binder which caused a great increase in the use of harvesters. This patent was sold to the McCormick and Deering companies in Chicago. He further invented the bark shaving mill, a machine used for cutting bark for tanners. He also secured other patents on successful appliances. He is survived by a widow and eight children.

F. H. KLIPP, superintendent of the Girard Boiler & Mfg. Company, Girard, Ohio, died October 4, at Kittanning, Pa., as the result of an accident while overlooking some work at the furnace of the Kittanning Iron & Steel Company. He was born at Lewistown, Ohio., March 13, 1857, but had been a resident of the Mahoning Valley from the time he was six years of age. He learned his trade with the W. B. Pollock Company. After serving in various capacities he became foreman in 1880 for the Reeves Boiler Works, Niles, Ohio. In 1884 he was one of the organizers of the Enterprise Boiler Company, Youngstown. In 1899 he retired from that connection and became identified with the Girard Boiler & Mfg. Company.

ARTHUR GAY BRIGHAM, formerly in the steel business with his father, Charles E. Brigham, Boston, Mass., died at Jamaica Plain, Mass., October 11, aged 41 years. He

had been in poor health for some years and had made his home at Colorado Springs. He leaves a widow.

NATHANIEL POTTS HOBART, connected with the American Brake Shoe & Foundry Company until two years ago, died at East Orange, N. J., October 13, aged 58 years. He was born at Orwigsburg, Pa., and leaves a widow and two children.

VICTOR M. KNECHT, a pioneer iron founder of Cincinnati, Ohio, and proprietor of the Phœnix Iron Works, 819-825 Wade street, died October 11 from uraemic poisoning. He was born in Nancy, France, in 1833, and when 12 years of age emigrated to Cincinnati with his parents. He learned the molder's trade in that city, and with several others organized the Eureka Foundry Company in 1866. A short time later he secured an interest in the Phœnix Works. He is survived by four sons and one daughter.

PERSONAL.

Carl Wallmann and Alfred Drieschner, chief engineers of Thyssen & Co., Muelheim, a.d. Ruhr, Germany, has sailed for home.

William F. Reebel, superintendent of the open hearth department of the Jones & Laughlin Steel Company, Pittsburgh, Pa., who has been in bad health for some time, will spend the winter in Colorado.

Linwood C. Tyler has been elected president and treasurer of the Union Iron Works, Bangor, Maine, to succeed the late Charles V. Lord. Mr. Tyler has been connected with the company since its formation, and was also a director of the Hinckley & Egery Iron Company, which with the Bangor Foundry Machine Company was merged into the Union Iron Works. Nathaniel Lord has been elected a director of the company to fill the vacancy caused by the death of his father.

W. J. Richards has been appointed general superintendent of the Lake Superior mines of Corrigan, McKinney & Co., Cleveland, Ohio. Mr. Richards has been for some years superintendent of the Menominee range properties of this company, and his new position covers not only the mines he has had in charge but those superintended by the late Amos Shepard of Duluth.

J. H. Dickey has resigned the position of sales manager of the Bettendorf Axle Company, Davenport, Iowa.

Emil Lungreen, who has been manager of the foundry operations of the King & Andrews Company, Chicago Heights, Ill., has become foundry manager for the Geneva Foundry & Machine Company, which will build a new foundry at Geneva, Ill.

J. C. Loughry, for some time connected with the foundry department of the National Tube Company at Lorain, Ohio, has resigned and will give all his time to developing foundry accounting systems, a line of work to which he has been giving attention for several years.

William H. Hugus has tendered his resignation to the H. C. Frick Coke Company as superintendent of the Davidson Works, to take effect February 1, 1906. He has been in the employ of the H. C. Frick Company since it started business.

O. B. Warren, Hibbing, Minn., has been made superintendent of the Pearce iron mine, near that place, which is to be reopened by the fee owners.

William C. Redfield of J. H. Williams & Co., Brooklyn, N. Y., manufacturers of drop forgings, has been elected a director of the Equitable Life Assurance Society, New York.

Joseph Cawley, formerly of James Bonar & Co. and the Pittsburgh Feed Water Heater Company, has been elected vice-president of the Cadwallader Tin Plate & Metal Company, Pittsburgh.

Julius Keller, superintendent of the St. Louis Foundries of the American Car & Foundry Company, has been placed in charge of all the foundries of that company.

Philip P. Barton, who heretofore has been superintendent of the Niagara Falls Power Company, has been appointed general manager of the business and operations of the company at Niagara Falls. deLancey Rankine has retired from the office of third vice-president of the company, and it is understood that at the first meeting he will be chosen to fill the vacancy in the Board of Directors caused by the death of William B. Rankine, but will devote all his time to the affairs of the Cataract Power & Conduit Company, of which he is both treasurer and secretary.

John Vanderslice, superintendent of the West Virginia Bridge Company, Wheeling, W. Va., has resigned to accept the position of superintendent of the American Locomotive & Machine Works, Montreal, Canada.

Norman M. Ward has been admitted as a partner to the firm of John Dunn, Son & Co., exporters, 66 Beaver street, New York City.

Eugene N. Foss of Boston has become a director of the Greene Consolidated Copper Company of Cananea, Sonora, Mexico.

A. S. Hay of Naylor, Benzon & Co., London, England, sailed for home on the Baltic October 18, after a brief stay in the United States.

John P. Brock, Lebanon, Pa.; Prof. E. D. Campbell, Ann Arbor, Mich.; John Gregson, Jr., Steelton, Pa.; J. E. Johnson, Jr., Longdale, Va., and Clement G. Smith, Steelton, Pa., were elected members of the Iron and Steel Institute at the recent Sheffield, England, meeting.

W. D. Holliday has resigned as district freight agent of the Wabash-Pittsburgh Terminal Railroad at Pittsburgh. His successor has not yet been announced.

H. T. Douglas, Jr., has been appointed consulting engineer of the Wabash lines east of Toledo, to succeed George T. Barnsley, chief engineer. Mr. Barnsley built the cantilever bridge over the Monongahela River, which connects the Wabash from the tunnel under Mount Washington to the terminal approaches along Ferry street in Pittsburgh.

P. N. Jones, for some years employed by the Westinghouse interests at Pittsburgh, has resigned to become mechanical engineer of the Pittsburgh Railways Company, operating the electric railway lines in that city. He will have direct supervision over the power houses and machinery of the company.

The Niagara, Lockport & Ontario Power Company.—At a meeting of the stockholders of this company, held in Lockport, N. Y., last week, the following Board of Directors were elected: Herman H. Westinghouse, Pittsburgh; George C. Smith and Robert E. Drake, Syracuse; Paul T. Brady and Carl A. Degersdorf, New York; John J. Albright, Stephen M. Clement, William H. Gratwick and Edmund Hayes, Buffalo. The five directors last named take the places of Charles Hickey, William H. Higgs, Isaac Babcock and William Richmond of Lockport and Patrick F. King of Niagara Falls, placing the company's affairs in full control of the outside capitalists, which leads Lockport people to believe that their long expectation of having a power canal built to that city from the Niagara River will not be realized, as the company is now building a power transmission line to distribute in Lockport and other cities electric power generated in Canada. The Board of Directors organized by electing Herman H. Westinghouse, president; Robert C. Board, secretary to Mr. Albright, secretary; John H. Lascelles, cashier of the Marine Bank, Buffalo, treasurer.

A new insulating compound known as galalith is to be manufactured in Hamburg on a large scale. The compound is formed from the casein of milk and is obtained in a plastic mass, which may be pressed into any form desired and then allowed to harden. It can be worked very well with a tool, being more elastic than ebonite, to which it is said to be scarcely inferior in its insulation properties and its resistance to spark discharges. This was shown by official tests in the imperial laboratory in Berlin, where it was found that galalith was not attacked by oil, benzine or alkalies. A pound of the material can be obtained from the casein in 8 gallons of milk.

Navy Yard Construction.

WASHINGTON, D. C., October 17, 1905.—A movement has been set on foot to secure authority from Congress in the next Naval Appropriation bill for the construction of at least one battle ship in a Government navy yard, presumably that at Brooklyn, the principal argument in support of the proposition being the alleged success that has attended the construction of the battle ship Connecticut "in competition with" the Newport News Shipbuilding & Dry Dock Company, which has built the sister ship Louisiana.

Eight-Hour Movement Involved.

The interest of the labor organiations in this matter is easily understood. The Government yards are operated on an eight-hour basis, and throughout their "sphere of influence" they have an important effect upon conditions of employment. Private shipyards in their neighborhood find it difficult to compete with the Government in the matter of wages, as workmen in all trades and especially machinists are eager to secure employment in the Government establishments. Organized labor counts heavily upon the expanding influence of the navy yards in the campaign for a universal eight-hour day, believing that the allotment of war ships to the Government yards will do more to embarrass private yards operating on a nine or ten hour basis than any other device that could be employed.

The co-operation of the Navy Department in this movement gives it a status which should not be ignored by the owners of private yards. The Bureau of Construction and Repair takes the position that the Government has spent so much money in equipping the Brooklyn yard to build war ships, and has gathered together so efficient an organization that much time and money would be wasted if no more big ships should be built in that yard. Every manufacturer will understand the considerations that appeal to the bureau, and will also appreciate the character of the influence likely to be exerted on Congress in the furtherance of this policy.

In all this discussion, however, it appears to be accepted as a fact that the competition between the Brooklyn Navy Yard building the Connecticut and the private concern constructing the Louisiana has resulted in favor of the former. This is an absolute fallacy, and as it is fundamental it should be fully understood. Neither vessel will be completed before next July, and until the last day's work has been paid for it will not be possible to determine the cost of the Connecticut.

The Connecticut-Louisiana Contest.

On October 1, according to the official reports, the Connecticut was 89.39 per cent. completed, while the percentage of the Louisiana was 87.73. When the Connecticut was launched on September 29, 1904, her percentage was 53.59, while that of the Louisiana upon the day of her launching, August 27, 1904, was 54.5. On September 1 of the current year the Louisiana was slightly ahead of the Connecticut, so that it will be seen that very uniform progress has been made in the building of the two ships. The contest thus far, however, has demonstrated only one important thing—namely, that it is possible for a Government yard to employ a sufficient number of men on an eight-hour basis to build a ship as rapidly as a private yard can do the same work efficiently and economically on a ten-hour basis. This is a fact of some interest, but it has no bearing whatever upon the main question in the minds of Congress when this competition was instituted; that is to say, whether the Government under the conditions imposed upon it can build ships as cheaply as private yards.

The claim that the Connecticut-Louisiana contest has resulted in favor of the Government yard is based largely upon certain figures submitted to the Commissioner of Labor by a special agent appointed to investigate the matter, whose findings were made November 1, 1904, and were presented in *The Iron Age* of February 9, 1905. The bare figures presented in this report showed that the average number of pounds per man per ten-hour day worked into the Louisiana was 50.608, while the average per man per eight-hour day in the case of the Connecticut was 50,390. These figures give a resulting average number of pounds per hour of 5.0608 in the case of the Louisiana and of 6.2995 in the case of the Connecticut. In presenting these figures the special agent drew attention to the fact that "the work of the Louisiana has been performed in the regular way, and under normal conditions, while that of the Connecticut indicates the putting forth of unusual and extraordinary effort and energy."

Cost Not Considered.

It is not surprising that the output per man per hour in the Brooklyn yard should be greater than that in the private yard, but as already pointed out, the rate of wages must be taken into account before the relative cost of the two ships can be even approximately shown, The builders of the Louisiana do not doubt that, even allowing a fair profit on the work, the vessel constructed by them will cost the Government considerably less than the Connecticut. The fact should also be borne in mind in this connection that it will hardly be practicable to make an absolutely accurate comparison of the cost of supervising the construction of the two vessels owing to the difference in organization, methods, &c.

The Bureau of Labor, which prepared and published the report on the Louisiana-Connecticut contest, finds itself somewhat embarrassed by the action of at least one of its special agents whose pro-labor tendencies have detracted seriously from his efficiency. This agent, in an address recently made at a labor meeting and which was fully reported in the daily press, criticised the conclusions reached by the bureau, declaring them to be "susceptible of explanation." The representatives of organized labor have naturally seized upon this statement to discredit the bureau's report. The facts have been brought to the attention of the Commissioner of Labor, and it is possible that a definite policy will be adopted with regard to the public speeches and writings of the bureau's agents. It has not been suggested that the freedom of speech of these agents should be abridged, but it is obviously improper for them to criticise the official findings of the bureau with which they are connected. W. L. C.

Labor Notes.

At a meeting of all its employees on October 7 the National Cash Register Company, Dayton, Ohio, announced that thereafter it would operate an open shop. The order went into effect October 9 and the men were then all at work. President O'Connell of the International Association of Machinists went to Dayton immediately after the order was issued, and accompanied by a committee had a conference with General Manager Chalmers of the company. It was stated after the conference that the management had simply repeated to Mr. O'Connell what it had told the men at the general meeting, adding that it now had an open shop and intended to keep it.

Latest advices state that by a vote of 964 to 345 the union employees of the National Cash Register Company, Dayton, Ohio, decided not to strike. With the overwhelming vote of loyalty to the company, expressing appreciation of the fairness and justice of the policy of its management by the employees, it is hoped that the strike for the present at least has been avoided. Manager Chalmers states that as a matter of fact the company has practically been running its plant on the open shop plan ever since the strike of four years ago and that the good men in the polishing room and foundry are earning more money, notwithstanding the fact that prices were adjusted, than they ever earned when these two departments were operated as closed shops.

The union chain makers at York, Pa., have rejected the plan to end the labor troubles among them and will stay out. The employing companies had offered liberal terms, but no recognition of the York union.

NEWS OF THE WORKS.

Iron and Steel.

The William B. Pollock Company, Youngstown, Ohio, builder of steel plate construction for blast furnaces and steel works, has secured contracts for a large amount of equipment for the new Bessemer steel plant of the Youngstown Sheet & Tube Company, now building at Youngstown, Ohio. These contracts include two 10-ton Bessemer converters with stands, operating cylinders, bottomjack and cars complete; four steel works cupolas with fittings and fixtures complete and eight 10-ton steel ladles. These orders are for delivery and erection of the work complete, and embrace that part of the Bessemer steel works equipment which the William B. Pollock Company manufactures.

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A jarless pneumatic hammer will be placed on the market by the Helwig Mfg. Company, St. Paul, Minn., maker of pneumatic tools and other labor saving devices. The company states that owing to the lack of vibration in its pneumatic hammer there is no strain on the user and consequently the working capacity of every operator is increased. The 9-inch stroke hammer weighs but 14 pounds and rivets up to 1¼ inches speedily.

The J. L. Taylor Dredge Mfg. Company, Royal Centre, Ind., is looking for a suitable site for its proposed new plant. The company will erect a modern plant to cost about $30,000, the main structure to be of concrete 60 x 300 feet. The company will make improved dredging machinery which will have a patent air cooled shoe friction and dipper handle holder. J. L. Taylor is president and general manager, Wm. Gundrum vice-president and W. J. Goodrich secretary and treasurer.

Cole & Thornley, Rhinebeck, N. Y., intend to fit out a complete plant for the manufacture of their patent horseshoe calks, the equipment to include a 1-inch bolt heading or forging machine, small crude oil furnace, screw machine and emery wheel grinders. While it has not been decided how much power will be required to operate the plant, it is probable that 10 horse-power will be sufficient and that a gasoline engine will be used. The firm is composed of W. B. Cole and F. H. Thornley.

The Insley Iron Works has been incorporated at Indianapolis, Ind., with $15,000 capital stock, by Ernest F. Knefler, Wm. H. Insley and Louis F. Aichorn.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has received an order from the Tonapah Mining Company for four electric hoists.

Some little machinery will be purchased by the Michigan Boat Company, Detroit, Mich., for equipping the building which it recently secured. Considerable machinery has already been purchased.

Power Plant Equipment.

The Murray Iron Works Company, Burlington, Iowa, is working on a number of important boiler contracts, among them being the following: One 250 horse-power water tube boiler, with complete combustion chambers, for Cape Girardeau, Mo.; two 300 horse-power for Kansas City, Mo.; one locomotive type boiler for the Boston-Montana Consolidated Copper Company, which will weigh when completed 45,000 pounds, and duplicating a boiler furnished the Copper Company September 15; three marine boilers for the Santa Fé Railroad, one 250 horse-power for its own plant and three boilers for the municipal lighting plant at Lincoln, Neb.

The Canadian Westinghouse Company was awarded a contract at $68,411 for the installation at Toronto, Canada, of two 5,000,000-gallon imperial turbine pumps and steam turbines.

George A. Upham, Watertown, Conn., will need either a gasoline engine or an electric motor of 15 to 20 horse-power in connection with the building which he is erecting at his lumber yard for a wood working shop.

The gas and electrical department of the city of Norwich, Conn., will add extensively to its lighting plant. The new equipment will consist of a 240-kw. two-phase 60-cycle alternating current General Electric generator, direct connected to a 360 horse-power Reliance Corliss tandem steam engine, and a water gas set and three purifiers manufactured by the Western Gas Construction Company, Fort Wayne, Ind. Several new buildings are being erected. The city is trying the experiment of municipal ownership.

The United Shoe Machinery Company is adding to its boiler house at its new plant at Beverly, Mass., and will install two 500 horse-power Babcock & Wilcox boilers.

Three orders of large size have recently been received by the Westinghouse Machine Company, East Pittsburgh, Pa., for its Roney mechanical stoker. One is from the Jones & Laughlin Steel Company, Pittsburgh, Pa., for 16 114 x 24 inch grate stokers; another is from the Lehigh Valley Traction Company, Philadelphia, Pa., for eight 130 x 20 inch grate stokers, and the third is from the Pressed Steel Car Company, Pittsburgh, Pa., for six 100 x 20 inch grate stokers. These stokers will be capable of burning low grade bituminous coal efficiently and without smoke In addition to these orders smaller ones have been received from the Brown Shoe Company, St. Louis, Mo.; Water, Light & Gas Company, Hutchinson, Kan.; William Wanton Dunnell, Aponaug, R. I.; Pennsylvania State College, State College, Pa.; Pennsylvania Heat & Power Company, Wilkinsburg, Pa.; Merchants' Light, Heat & Power Company, Canton, Ohio; Schlitz Brewing Company, Milwaukee, Wis., and United Shoe Machinery Company, Beverly, Mass.

The Abner Doble Company, San Francisco, Cal., has recently received several interesting orders for Doble tangential water wheels. Prominent among them is an order from the California Gas & Electric Corporation for a 9000 horse-power wheel for its De Sabla power plant. This machine will be similar to the 8000 horse-power wheel installed in the De Sabla plant last year and the three 8000 horse-power wheels recently completed and now successfully operating in the new electric station of the same company. The wheel will operate under a head of 1530 feet at 400 revolutions per minute and will be driven by a single jet of water, thus making it the most powerful water wheel ever constructed for operation under a single jet of water. Among the other orders are one Doble needle regulating nozzle for a large water wheel for the Komata Reefs Gold Mining Company, New Zealand, and a double 700 horse-power water wheel unit for Mitsui & Co., Japan, for operation under 210-foot head, this order including the wheel complete with Lombard governor and gate valve.

The Ideal Stoker, 114 Liberty street, New York, has secured a contract for the installation of Ideal stokers at the Bayonne, N. J., works of the Para Recovery Company.

The Hough Pump Company, Franklin, Pa., has incorporated to put on the market a new pump for all deep oil and artesian wells which is a new departure from the pumps now in use. The pumps will be manufactured by the Chas. N. Hough Mfg. Company of that city, which is well equipped for turning out goods of that character.

Foundries.

The new plant of the Gibson-White Foundry Company at Alton Park, Chattanooga, Tenn., is now in full operation. The Gibson-White Company purchased the plant from the Southern Iron Works and during the summer made extensive improvements to the buildings and installed new machinery. The company will manufacture stoves, hollow ware and grates. Fillmore Gibson, the manager, has had many years' experience in foundry work. He has been interested in several foundries in past years and was instrumental many years ago in locating the first stove foundry at Chattanooga.

Aug. Wilshuen of Stafford, Kan., has made preparations for the installation of an iron foundry for use in connection with his factory.

A charter has been secured at Birmingham, Ala., by the Webber Iron Works, which is capitalized at $10,000 and will erect a foundry. P. S. Webber, president; J. A. Pilcher, G. A. Gowan and others are the incorporators.

The Manufacturers' Foundry Company, Waterbury, Conn., manufacturer of castings for gasoline engine cylinders and general purposes, is to build two one-story additions to its works, one to be 22 x 51 feet, of brick, heavy mill construction; the other of frame construction, 40 x 50 feet. No new equipment is required.

Davidweiser & Wiand, Pottstown, Pa., have started work on the big foundry for the Stanley G. Flagg Company at that place. It will be 340 x 100 feet. It will be one of the largest foundries in the Schuylkill Valley.

The Ross-Meehan Foundry Company, Chattanooga, Tenn., is erecting a building 110 x 65 feet, for the making and storing of cores. It is also building two annealing ovens, each of 15 tons capacity.

The G. F. Burton Company, Springfield, Ohio, has been incorporated with $10,000 capital by G. F. Burton *et al.* It will manufacture foundry supplies.

The Pittsburgh Valve & Fittings Company, Pittsburgh, Pa., is erecting a fire proof pattern shop, 40 x 100 feet, one story, and a fire proof vault for pattern storage, 50 x 30 feet, 20 feet high, at its Barberton (Ohio) plant. No new machinery is required.

The plant of the Standard Car & Machine Company at Uniontown, Pa., has been sold to the American Brake Shoe & Foundry Company, New York, who will operate it.

Bridges and Buildings.

The Russell Wheel & Foundry Company, Detroit, Mich., received the steel contract for the Murphy Power Building to be erected at the corner of Wayne and Congress streets, Detroit. This is said to be the largest steel contract for a building ever let in Michigan, amounting to about 3,000 tons.

The Commissioners of Chester and Montgomery counties, Pennsylvania, have formulated plans to begin work this fall on the construction of a steel bridge across the Schuylkill River, bids for which will soon be asked.

Upon petition of Ross B. Stark, a stockholder, Joseph W. Porter has been appointed receiver for the Ohio Steel Erecting Company, Steubenville, Ohio. The company was incorporated under Delaware laws with a capital of $50,000 and is alleged to be insolvent.

The Pacific Bridge Company, Portland, Ore., received a contract at $27,625 for the erection of a steel bridge over the Wishka River at Aberdeen, Wash.

Fires.

The foundry of R. Estabrook & Son, South Boston, Mass., was destroyed by fire October 10.

The barrel factory of Goepper Bros. Company, East Cambridge, Mass., was destroyed by fire October 10, with a loss of $35,000.

The Riverside Foundry & Machine Works, Riverside, Cal., was recently destroyed by fire, the loss being about $28,000.

Hardware.

The G. Drouvé Company, Bridgeport, Conn., has booked a number of contracts for the Anti-Pluvius Skylight, including about 15,000 square feet for the new public library building on Forty-second street, New York; 30,000 square feet for the Edison power house, New York, and 3,000 square feet for the West Virginia Pulp & Paper Company, Mechanicsville, N. Y. Orders for the Lovell sash operating device have been received for the equipment of the mill of J. L. Stifel & Sons, Wheeling, W. Va.; erecting shops of the Pennsylvania Railroad, Altoona, Pa.; new building for the Alden-Sampson Mfg. Company, Pittsfield, Mass.; shops of the Southern Pacific Railroad, Ogden, Utah, and the Dupont Powder Company's works, Wilmington, Del. Orders for skylight work have been received from Isaac G. Johnson & Co., Spuyten Duyvil, N. Y., and the Firth Carpet Company, Firth Cliff, N. Y.

The New Castle Shovel Company, formerly of New Castle, Ind., has been reorganized and moved to Owensboro, Ky., being now styled the Owensboro Shovel & Tool Company. Announcement is made that desirable orders have been booked and that operations will be confined to turning out the better grades of goods, practically eliminating what are known as fourth-grade goods from the output.

The Hussey Farm Tool Company, Indianapolis, Ind., has succeeded the Niagara Plow Company of Indianapolis and the Hussey Mower Company of Knightstown, Ind.

Mott, Lauritzen & Breniman, manufacturers of the One Minute washer, have opened a temporary office in the Lodick Building, Sandusky, Ohio, and are making preparations for the establishment of a factory in the Stapleton Building, on East Water street, in that city. The firm is being supplied with machines to commence business from the factory at Newton, Iowa, where the washer is made for Iowa and several adjoining States. Electric motor, lathe, drill press and other machinery, together with castings and other parts of the machines, have been ordered for the Sandusky factory, where the washers will be made for the newly established territory, which embraces some twenty States East and South.

The Hays-Henderson Saw & Supply Company, Chattanooga, Tenn., has been organized and incorporated under the State laws of Tennessee for the manufacture of circular saws, planer knives

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Plans are being prepared and building operations will commence at once on a four-story, with full basement, brick and steel factory addition to the plant of the National-Acme Mfg. Company, Cleveland, Ohio. It is hoped to have the building in readiness for occupancy early in 1906. The four-story addition built during the past summer afforded only slight and temporary relief to the crowded condition of all departments, and the present capacity will be more than doubled when the improvements under way have been carried out. The company builds the "Acme Automatic," the only multiple spindle screw machine on the market, and manufactures also the product therefrom—set screws, cap screws and special milled parts. Recent orders have been booked for deliveries to Europe, Asia and South America. The company maintains branch offices in New York, Boston and Chicago, and is represented in Europe by Schuchardt & Schütte and Alfred H. Schütte.

The Wellman-Seaver-Morgan Company, Cleveland, Ohio, has been awarded the contract to furnish for the Wheeling & Lake Erie Railroad, at Huron, Ohio, a complete ore handling plant, consisting of four Hulett ore unloading machines, equipped with the Hulett patented excavating bucket. These machines will be able to span four tracks, having a cantilever at the rear of the machines and folding boom at the front, or water, side of the machines. The plant is to be completed by May 1, 1906. The Wellman-Seaver-Morgan Company has recently closed a number of important contracts for steel works machinery for Great Britain and mining outfits for Nevada and Mexico.

A jarless pneumatic hammer will be placed on the market by the Helwig Mfg. Company, St. Paul, Minn., maker of pneumatic tools and other labor saving devices. The company states that owing to the lack of vibration in its pneumatic hammer there is no strain on the user and consequently the working capacity of every operator is increased. The 9-inch stroke hammer weighs but 14 pounds and rivets up to 1¼ inches speedily.

The J. L. Taylor Dredge Mfg. Company, Royal Centre, Ind., is looking for a suitable site for its proposed new plant. The company will erect a modern plant to cost about $30,000, the main structure to be of concrete 60 x 300 feet. The company will make improved dredging machinery which will have a patent air cooled shoe friction and dipper handle holder. J. L. Taylor is president and general manager, Wm. Gundrum vice-president and W. J. Goodrich secretary and treasurer.

Cole & Thornley, Rhinebeck, N. Y., intend to fit out a complete plant for the manufacture of their patent horseshoe calks, the equipment to include a 1-inch bolt heading or forging machine, small crude oil furnace, screw machine and emery wheel grinders. While it has not been decided how much power will be required to operate the plant, it is probable that 10 horsepower will be sufficient and that a gasoline engine will be used. The firm is composed of W. B. Cole and F. H. Thornley.

The Insley Iron Works has been incorporated at Indianapolis, Ind., with $15,000 capital stock, by Ernest F. Knefler, Wm. H. Insley and Louis F. Aichorn.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has received an order from the Tonapah Mining Company for four electric hoists.

Some little machinery will be purchased by the Michigan Boat Company, Detroit, Mich., for equipping the building which it recently secured. Considerable machinery has already been purchased.

Power Plant Equipment.

The Murray Iron Works Company, Burlington, Iowa, is working on a number of important boiler contracts, among them being the following: One 250 horse-power water tube boiler, with complete combustion chambers, for Cape Girardeau, Mo.; two 300 horse-power for Kansas City, Mo.; one locomotive type boiler for the Boston-Montana Consolidated Copper Company, which will weigh when completed 45,000 pounds, and duplicating a boiler furnished the Copper Company September 15; three marine boilers for the Santa Fé Railroad, one 250 horse-power for its own plant and three boilers for the municipal lighting plant at Lincoln, Neb.

The Canadian Westinghouse Company was awarded a contract at $68,411 for the installation at Toronto, Canada, of two 5,000,000-gallon imperial turbine pumps and steam turbines.

George A. Upham, Watertown, Conn., will need either a gasoline engine or an electric motor of 15 to 20 horse-power in connection with the building which he is erecting at his lumber yard for a wood working shop.

The gas and electrical department of the city of Norwich, Conn., will add extensively to its lighting plant. The new equipment will consist of a 240-kw. two-phase 60-cycle alternating current General Electric generator, direct connected to a 360 horse-power Reliance Corliss tandem steam engine, and a water gas set and three purifiers manufactured by the Western Gas Construction Company, Fort Wayne, Ind. Several new buildings are being erected. The city is trying the experiment of municipal ownership.

The United Shoe Machinery Company is adding to its boiler house at its new plant at Beverly, Mass., and will install two 500 horse-power Babcock & Wilcox boilers.

Three orders of large size have recently been received by the Westinghouse Machine Company, East Pittsburgh, Pa., for its Roney mechanical stoker. One is from the Jones & Laughlin Steel Company, Pittsburgh, Pa., for 16 114 x 24 inch grate stokers; another is from the Lehigh Valley Traction Company, Philadelphia, Pa., for eight 130 x 20 inch grate stokers, and the third is from the Pressed Steel Car Company, Pittsburgh, Pa., for six 100 x 20 inch grate stokers. These stokers will be capable of burning low grade bituminous coal efficiently and without smoke. In addition to these orders smaller ones have been received from the Brown Shoe Company, St. Louis, Mo.; Water, Light & Gas Company, Hutchinson, Kan.; William Wanton Dunnell, Aponaug, R. I.; Pennsylvania State College, State College, Pa.; Pennsylvania Heat & Power Company, Wilkinsburg, Pa.; Merchants' Light, Heat & Power Company, Canton, Ohio; Schlitz Brewing Company, Milwaukee, Wis., and United Shoe Machinery Company, Beverly, Mass.

The Abner Doble Company, San Francisco, Cal., has recently received several interesting orders for Doble tangential water wheels. Prominent among them is an order from the California Gas & Electric Corporation for a 9000 horse-power wheel for its De Sabla power plant. This machine will be similar to the 8000 horse-power wheel installed in the De Sabla plant last year and the three 8000 horse-power wheels recently completed and now successfully operating in the new electric station of the same company. The wheel will operate under a head of 1530 feet at 400 revolutions per minute and will be driven by a single jet of water, thus making it the most powerful water wheel ever constructed for operation under a single jet of water. Among the other orders are one Doble needle regulating nozzle for a large water wheel for the Komata Reefs Gold Mining Company, New Zealand, and a double 700 horse-power water wheel unit for Mitsui & Co., Japan, for operation under 210-foot head, this order including the wheel complete with Lombard governor and gate valve.

The Ideal Stoker, 114 Liberty street, New York, has secured a contract for the installation of Ideal stokers at the Bayonne, N. J., works of the Para Recovery Company.

The Hough Pump Company, Franklin, Pa., has incorporated to put on the market a new pump for all deep oil and artesian wells which is a new departure from the pumps now in use. The pumps will be manufactured by the Chas. N. Hough Mfg. Company of that city, which is well equipped for turning out goods of that character.

Foundries.

The new plant of the Gibson-White Foundry Company at Alton Park, Chattanooga, Tenn., is now in full operation. The Gibson-White Company purchased the plant from the Southern Iron Works and during the summer made extensive improvements to the buildings and installed new machinery. The company will manufacture stoves, hollow ware and grates. Fillmore Gibson, the manager, has had many years' experience in foundry work. He has been interested in several foundries in past years and was instrumental many years ago in locating the first stove foundry at Chattanooga.

Aug. Wilshuen of Stafford, Kan., has made preparations for the installation of an iron foundry for use in connection with his factory.

A charter has been secured at Birmingham, Ala., by the Webber Iron Works, which is capitalized at $10,000 and will erect a foundry. P. S. Webber, president; J. A. Pilcher, G. A. Gowan and others are the incorporators.

The Manufacturers' Foundry Company, Waterbury, Conn., manufacturer of castings for gasoline engine cylinders and general purposes, is to build two one-story additions to its works, one to be 22 x 51 feet, of brick, heavy mill construction; the other of frame construction, 40 x 50 feet. No new equipment is required.

Davidweiser & Wiand, Pottstown, Pa., have started work on the big foundry for the Stanley G. Flagg Company at that place. It will be 340 x 100 feet. It will be one of the largest foundries in the Schuylkill Valley.

The Ross-Meehan Foundry Company, Chattanooga, Tenn., is erecting a building 110 x 65 feet, for the making and storing of cores. It is also building two annealing ovens, each of 15 tons capacity.

The G. F. Burton Company, Springfield, Ohio, has been incorporated with $10,000 capital by G. F. Burton *et al.* It will manufacture foundry supplies.

The Pittsburgh Valve & Fittings Company, Pittsburgh, Pa., is erecting a fire proof pattern shop, 40 x 100 feet, one story, and a fire proof vault for pattern storage, 50 x 30 feet, 20 feet high, at its Barberton (Ohio) plant. No new machinery is required.

The plant of the Standard Car & Machine Company at Uniontown, Pa., has been sold to the American Brake Shoe & Foundry Company, New York, who will operate it.

Bridges and Buildings.

The Russell Wheel & Foundry Company, Detroit, Mich., received the steel contract for the Murphy Power Building to be erected at the corner of Wayne and Congress streets, Detroit. This is said to be the largest steel contract for a building ever let in Michigan, amounting to about 3,000 tons.

The Commissioners of Chester and Montgomery counties, Pennsylvania, have formulated plans to begin work this fall on the construction of a steel bridge across the Schuylkill River, bids for which will soon be asked.

Upon petition of Ross B. Stark, a stockholder, Joseph W. Porter has been appointed receiver for the Ohio Steel Erecting Company, Steubenville, Ohio. The company was incorporated under Delaware laws with a capital of $50,000 and is alleged to be insolvent.

The Pacific Bridge Company, Portland, Ore., received a contract at $27,625 for the erection of a steel bridge over the Wishka River at Aberdeen, Wash.

Fires.

The foundry of R. Estabrook & Son, South Boston, Mass., was destroyed by fire October 10.

The barrel factory of Goepper Bros. Company, East Cambridge, Mass., was destroyed by fire October 10, with a loss of $35,000.

The Riverside Foundry & Machine Works, Riverside, Cal., was recently destroyed by fire, the loss being about $28,000.

Hardware.

The G. Drouvé Company, Bridgeport, Conn., has booked a number of contracts for the Anti-Pluvius Skylight, including about 15,000 square feet for the new public library building on Forty-second street, New York; 30,000 square feet for the Edison power house, New York, and 3,000 square feet for the West Virginia Pulp & Paper Company, Mechanicsville, N. Y. Orders for the Lovell sash operating device have been received for the equipment of the mill of J. L. Stifel & Sons, Wheeling, W. Va.; erecting shops of the Pennsylvania Railroad, Altoona, Pa.; new building for the Alden-Sampson Mfg. Company, Pittsfield, Mass.; shops of the Southern Pacific Railroad, Ogden, Utah, and the Dupont Powder Company's works, Wilmington, Del. Orders for skylight work have been received from Isaac G. Johnson & Co., Spuyten Duyvil, N. Y., and the Firth Carpet Company, Firth Cliff, N. Y.

The New Castle Shovel Company, formerly of New Castle, Ind., has been reorganized and moved to Owensboro, Ky., being now styled the Owensboro Shovel & Tool Company. Announcement is made that desirable orders have been booked and that operations will be confined to turning out the better grades of goods, practically eliminating what are known as fourth-grade goods from the output.

The Hussey Farm Tool Company, Indianapolis, Ind., has succeeded the Niagara Plow Company of Indianapolis and the Hussey Mower Company of Knightstown, Ind.

Mott, Lauritzen & Breniman, manufacturers of the One Minute washer, have opened a temporary office in the Lodick Building, Sandusky, Ohio, and are making preparations for the establishment of a factory in the Stapleton Building, on East Water street, in that city. The firm is being supplied with machines to commence business from the factory at Newton, Iowa, where the washer is made for Iowa and several adjoining States. Electric motor, lathe, drill press and other machinery, together with castings and other parts of the machines, have been ordered for the Sandusky factory, where the washers will be made for the newly established territory, which embraces some twenty States East and South.

The Hays-Henderson Saw & Supply Company, Chattanooga, Tenn., has been organized and incorporated under the State laws of Tennessee for the manufacture of circular saws, planer knives

and bits. A specialty will be made of repair work, including gumming, filing, hammering and retempering. Mill supplies will also be carried.

The New Castle Forge & Bolt Company, New Castle, Pa., part of whose plant was destroyed by fire some time since, is now running to nearly full capacity and making almost as much tonnage as before the fire. The company reports a large amount of business on its books. Its manufactures consist of car forgings, chain, bolts, nuts, rivets and wrought washers.

The Dicke Tool Company, Downers Grove, Ill., will rebuild its shops recently destroyed by fire, the new plant comprising a main building 150 x 50 feet and a blacksmith shop 38 x 40 feet. The company manufactures linemen's construction tools and hardware specialties. It started business in a small factory in Chicago in 1886, moving to Downers Grove on account of heavily increased business in 1890.

The White Lily Washer Company, Davenport, Iowa, has supplemented the equipment of its plant with a 100 horse-power boiler and an improved fan system of dry kilns. The improvements will give the company a capacity of about 500 machines a day.

The new building which the New Home Sewing Machine Company, Orange, Mass., will erect as soon as the factory now under construction is completed will be 70 x 100 feet and four stories and will be devoted to the shipping department.

The International Silver Company is building a brick addition to the melting and rolling mill located at its Factory M, Wallingford, Conn., formerly the factory of Simpson, Hall, Miller & Co. The silver for both flat ware and hollow ware for the entire International Silver Company is furnished from this department.

The Howe Scale Company, Rutland, Vt., will build a three-story addition to its plant, to be 50 x 80 feet. The new building will contain iron, wood and pattern shops, the draughting department and rooms for photographic work, and also a series of fire proof vaults, 15 x 30 feet, one on each floor and built one above the other.

Luther W. Carden of Iron City, Tenn., and other business men of Tennessee and Alabama have organized the Florence Machine & Railroad Supply Company at Florence, Ala., and purchased the Hoxie-Kells machine shops in East Florence for the purpose of manufacturing the Carden smooth surface roller cattle guard. Major A. J. McGarry of Florence is president, L. W. Carden, patentee, secretary, and James Garrett of Lawrencebrug, Forsythe Brothers of Iron City and George L. Hoxie of Florence are large stockholders. New machinery and equipment for the manufacture of the cattle guard will be installed.

Miscellaneous.

The Morrow Mfg. Company, Wellston, Ohio., capital $25,000, was incorporated this week by Jerry Morrow, Will P. Morrow, H. C. Morrow and Jere. H. Morrow. It will make trolley wheels, harps and other specialties.

The National Interurban Metal Company, Columbus, Ohio, has been incorporated with $5,000 capital by John C. Davey and others.

The Crompton & Knowles Loom Works, Worcester, Mass., has purchased the business of A. H. Steele & Bro. of that city, manufactures of quillers and other textile appliances, and has removed the machinery to the loom works.

The Curtis & Marble Machine Company, Worcester, Mass., manufacturer of cloth finishing machinery, has purchased the business and equipment of the Miller Press & Machine Company, Woonsocket, R. I., manufacturer of the Miller flexible bed press used in textile manufacturing, and also the business of the Atlas Foundry & Machine Company, Irvington, N. J., manufacturer of woolen machinery, the specialty being equipment for picker rooms. Both industries will be removed to the Curtis & Marble plant, Worcester, where there is ample space for the enlargement.

Clarence W. Ferguson and Henry Green, formerly with the Hartford Bedstead Company, Hartford, Conn., have established a business under the name of the National Wire Works, to manufacture office and bank railings, wire partitions, guards, &c. The shop is located at 308 Pearl street, Hartford.

The Athol Pump Company, Athol, Mass., is erecting a new building 30 feet square and one story for its brass ferrule department, which will be removed from the main building, permitting additional room in that structure for other departments. The company manufactures suction and force pumps.

The Chicago Bridge & Iron Works, Chicago, was awarded contract by the Great Northern Power Company, Duluth, for the erection of a steel standpipe consisting of a steel tank with hemispherical bottom, having a capacity of about 310,000 gallons, carried on a four-column steel tower. The hight to the top of the tank is approximately 232 feet. Connection between the tank and the reservoir at the bottom is made by riveted steel pipe 6 inches in diameter.

The Bucyrus Company, South Milwaukee, Wis., manufacturer of dredges and steam shovels, has for many months been working day and night getting out large orders for the Government and for mining and railroad corporations. The company has recently received a contract from the Panama Canal Commission for 49 steam shovels for work on the canal. This is in addition to the orders which were filled for the Government earlier in the year.

The Archambault Company has been organized under Connecticut laws to take over the business of A. J. Archambault, inventor of the Archambault kerosene burner for plumbers and tinners' furnaces and torches. The officers are: President, George A. French, formerly the Hartford superintendent of the Southern New England Telephone Company; vice-president, George T. Manson; secretary and treasurer, Ellis B. Baker, formerly general superintendent of the Southern New England Telephone Company; superintendent, Arthur J. Archambault. Directors, these officers and Albert C. Bill. The office of the company is at 15 Cortlandt street, New York, and the temporary factory is at Rutherford, N. J. Nothing will be done for the present in the way of erecting new works.

The Harrisburg Mfg. & Boiler Company, Harrisburg, Pa., has taken a large order for steel pipes and tanks for Mexican concerns.

The Taft-Pierce Company, Woonsocket, R. I., has taken the contract for a large amount of work for the Tabulating Machine Company, Washington, D. C., manufacturer of instruments for accounting. The Taft-Pierce Company has done a great deal of work for the same company in years past, and some special lines now in course of development promise an access of the business.

The Reo Motor Car Company, Lansing, Mich., will build an addition to its plant which will be used as an erecting floor.

The Western Steel Car Company, Hammond, Ind., has booked contracts sufficient to keep the plant running day and night for three years. Twelve hundred men are employed and the company is making additions that will give work to 600 more men.

The Mount Vernon Mfg. Company has been incorporated at Mount Vernon, Ind., with $10,000 capital stock, to manufacture hay presses. The directors are Henry Spencer, John F. Staiger and G. A. Ashworth.

It is stated that some capitalists of Youngstown, Ohio, are negotiating for the purchase of the plant of the Garry Steel Roofing Company, Cleveland, Ohio, which was placed in the hands of a receiver some months ago. Among those interested are William A. Kingsley, formerly with the General Fire Proofing Company of Youngstown, and George D. Wicks of that city.

The Royal Battery Company, 143 Chambers street, New York, now controls the sole manufacturing rights of the Geecee battery, which is claimed to have proved one of the most popular storage batteries ever placed on the market. The National Sales Corporation, 256 Broadway, represents the selling end of the Royal Storage Battery Company, and will control the exclusive marketing of the Geecee battery.

The organization of the Cross Mountain Iron Company was completed at Bristol, Tenn., this week by the election of George K. Hamblen of New York as president; Charles P. Toncray of Elizabethton, Tenn., vice-president and general manager, and William Spalding of Boston as secretary and treasurer. The company will be incorporated with a capital stock of $60,000. After all the details of organization are completed and the charter granted plans for the working of the iron mines will go forward. The company recently purchased from the Boston Iron & Timber Company the rights of 6,900 acres of fine timber and iron ore lands at the headwaters of Stoney Creek.

The Pittsburgh Plate Glass Company, Pittsburgh, has established another warehouse and jobbing department at Grand Rapids, Mich., making a total of 26 branch houses in various parts of the country maintained by the company.

The Tyrone coke plant at Bradford, Pa., which has been idle for six years and practically dismantled, has been repaired and will be operated by J. N. Kendal of Pittsburgh, Robert O. Thomas and John Guiler of Connellsville, Pa. The plant was formerly owned by Jones & Laughlin Steel Company of Pittsburgh.

The Underwood Typewriter Company is adding about 170,000 square feet of floor space to its plant at Hartford, Conn., with a view to practically doubling its output. The company will install about 1000 additional horse-power, and all the machinery equipment, it is stated, has been contracted for.

The Struthers Coal & Coke Company, an identified interest of the Struthers Furnace Company, at Struthers, Ohio, has awarded a contract for the building of 160 coke ovens at New Salem, Pa. The Struthers Furnace Company will put itself in position to supply its entire requirements of coke for its blast furnace.

The partnership between M. S. Bankert and A. C. Frey, doing business under the name of the Sheet Metal Stamping & Machine Company, Arrott Power Building No. 2, Pittsburgh, Pa., has been dissolved. The business will be continued by A. C. Frey.

The Brooklyn Range & Boiler Company, Brooklyn, N. Y., is building a new factory in Long Island City on a site 50 x 180 feet.

The Cambria Steel Company, Johnstown, Pa., has secured an order from the Central Railroad of New Jersey for 1000 steel hopper gondola cars of 50 tons capacity.

The Iron and Metal Trades

The leading interests in the Steel industry are more and more emphatically taking a position adverse to any violent upward price movement. They are endeavoring not alone to keep values of raw material within bounds, but are holding down prices on Finished Iron and Steel. This is shown by the character of the buying of Pig Iron on the one hand, and by the success in keeping the official price of Plates at the old figure.

The markets for Pig Iron have stiffened. This week it is the East and the Central West which have marked up quotations. Some of the large Southern interests have practically withdrawn from the market entirely, but there is still some, though little, Iron available on the basis of $12.50 for No. 2 at Birmingham.

In the Central West, the news of greatest interest is that the Steel Corporation has purchased 20,000 tons of Iron for October delivery at $15.50, at furnace, and 20,000 tons for November delivery at $16, thus establishing an advance. The quantities purchased, however, are smaller than expected.

There has been further good buying in the Eastern markets and prices have been advanced to $16.50 to $16.75, at furnace, for No. 2 Foundry and $17.50 to $17.75, delivered, for Basic Pig. A leading Buffalo interest has to-day put up prices 50c. per ton.

The reaffirming of the official price of $23 for Steel Billets by the makers interests nobody, since the "official price" has long since been inoperative. What transactions have taken place during the last few months have been at considerably higher figures. In the Eastern markets very considerable quantities of Open Hearth Steel have been selling lately at $28.

A number of moderate sized lots of Steel Rails have been contracted for during the last week. It is understood that thus far the New York Central Company has allotted about 125,000 tons of its requirements and that the Baltimore & Ohio Company is in the market for 71,000 tons.

The pressure upon the car builders and locomotive shops is enormous. It is figured out that there are contracts in sight for 80,000 Steel cars, which include the 20,000 cars just being figured on for the Pennsylvania system. The locomotive builders are crowded and are covering liberally for their materials. One large interest has contracted for a total of 75,000 tons of Bars, Plates, &c.

Reports from the lighter lines are very encouraging. Even in the Tin Plate trade orders and specifications are on a more satisfactory scale.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 18, 1905.	Oct. 11, 1905.	Sept. 20, 1905.	Oct. 19, 1904.
PIG IRON:				
Poundry Pig No. 2, Standard, Philadelphia	**$17.25**	$17.25	$16.50	$14.50
Foundry Pig No. 2, Standard, Cincinnati	**15.25**	15.25	14.25	13.00
Foundry Pig No. 2, Local, Chicago	**17.50**	17.25	16.00	13.50
Bessemer Pig, Pittsburgh	**16.60**	16.35	15.85	13.10
Gray Forge, Pittsburgh	**15.85**	15.60	14.60	12.25
Lake Superior Charcoal, Chicago	**18.50**	18.50	17.00	15.25
BILLETS, RAILS, &c.:				
Bessemer Billets, Pittsburgh	**26.00**	25.00	25.00	19.50
Steel Forging Billets, Pittsburgh	29.00	29.00	29.00	....
Open Hearth Billets, Philadelphia	**28.50**	28.00	27.00	22.00
Wire Rods, Pitsburgh	**32.00**	31.50	31.00	26.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	14.50	14.50	14.50	11.00
O. Steel Rails, Philadelphia	**17.25**	16.50	16.25	13.00
O. Iron Rails, Chicago	22.00	22.00	22.00	16.50
O. Iron Rails, Philadelphia	**22.50**	22.50	22.00	16.50
O. Car Wheels, Chicago	16.00	16.00	16.00	12.00
O. Car Wheels, Philadelphia	**17.00**	16.00	15.50	12.50
Heavy Steel Scrap, Pittsburgh	**16.50**	16.50	16.00	12.50
Heavy Steel Scrap, Chicago	14.50	14.50	14.50	11.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	**1.83½**	1.73½	1.68½	1.43½
Common Iron Bars, Chicago	**1.80**	1.75	1.65	1.35
Common Iron Bars, Pittsburgh	1.74¾	1.74¾	1.74¾	1.30
Steel Bars, Tidewater	1.64½	1.64½	1.64½	1.44½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.30
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.54½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.40
Beams, Tidewater	1.89½	1.89½	1.89½	1.54½
Beams, Pittsburgh	1.70	1.70	1.70	1.40
Angles, Tidewater	1.89½	1.89½	1.89½	1.54½
Angles, Pitsburgh	1.70	1.70	1.70	1.40
Skelp, Grooved Steel, Pittsburgh	1.50	1.50	1.50	1.30
Skelp, Sheared Steel, Pittsburgh	1.55	1.55	1.55	1.35
Sheets, No. 27, Pitsburgh	*2.15*	2.15	2.20	2.00
Barb Wire, Galv., Pittsburgh	**2.25**	2.25	2.20	2.05
Wire Nails, Pittsburgh	**1.80**	1.80	1.75	1.60
Cut Nails, Pittsburgh	**1.65**	1.65	1.60	1.60
METALS:				
Copper, New York	**16.62½**	16.62½	16.00	13.12½
Spelter, St. Louis	**5.95**	5.85	5.85	5.15
Lead, New York	**5.25**	4.95	4.85	4.20
Lead, St. Louis	**4.95**	4.92½	4.72½	4.20
Tin, New York	**32.60**	32.20	32.00	28.82½
Antimony, Hallett, New York	*12.25*	12.25	14.00	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	*3.49*	3.49	3.74	3.49

Chicago.

FISHER BUILDING, October 17, 1905.—(*By Telegraph.*)

A quieter tone pervades the Iron and Steel market. The buying of both raw and finished material during the week was on a smaller scale than at any time during the past two months. Sales of Pig Iron were limited almost entirely to small lots for future shipment, but at prices ranging from 25c. to 50c. above those prevailing the previous week. Southern Iron is now firmly established on a basis of $13, Birmingham, for No. 2, and one Southern interest closed a number of small contracts aggregating 2000 tons at $13.50. While the new Steel Bar tonnage of the leading local interest has fallen off materially current business continues 50 per cent. greater than the output. Iron Bars have been advanced $1 a ton, two roads having purchased 1000 tons each at 1.80c. On Steel Bars for immediate delivery a premium of $2 a ton is readily secured. Specifications for Plates, Structural and Agricultural Shapes greatly exceed the output of mills and deliveries are gradually being further deferred. Large orders for Wire Nails and Wire products are being received from the fever stricken Southern States, where business has been at a standstill for nearly four months. The current demand for Cast Iron Pipe continues heavy on account of the open weather prevailing throughout the West, the largest municipal letting having been made by Los Angeles, Cal., providing for 5000 tons. The bookings of Rails were light, amounting to only 11,000 tons for delivery in November, 1906. Car shortage continues to interfere with mill shipments, and the inadequate transfer facilities in this district delays deliveries to consumers.

Pig Iron.—The aggregate tonnage sold in this market during the week was small as compared with that of pre-

vious weeks; nevertheless, prices continue to advance. Producers are not anxious to take on additional tonnage, having already booked heavily for future requirements. Local furnaces are out of the market for the remainder of the year, while one Southern interest not only moved a stock of 70,000 tons but booked 280,000 tons in addition during the heavy buying movement. The Lake Superior Charcoal furnaces have almost succeeded in moving their accumulation, and the advanced price of $17, furnace, or $18.50, Chicago, named last week, has been firmly maintained. Southern Iron is firm on the basis of $13, Birmingham, for No. 2, and one interest is experiencing no difficulty in securing $13.50. Local furnaces are asking $17.50 at the furnace, equivalent to $17.75 to $18, delivered. We quote, at Chicago, as follows:

Lake Superior Charcoal	$18.50
Northern Coke Foundry, No. 1	$18.25 to 18.50
Northern Coke Foundry, No. 2	17.50 to 18.00
Northern Coke Foundry, No. 3	17.00 to 17.50
Northern Scotch, No. 1	18.25 to 18.50
Ohio Strong Softeners, No. 1	18.55 to 18.80
Ohio Strong Softeners, No. 2	18.30 to 18.55
Southern Silvery, 4 to 6 per cent. Silicon.	17.90 to 18.90
Southern Coke, No. 1	17.15 to 17.65
Southern Coke, No. 2	16.65 to 17.15
Southern Coke, No. 3	16.15 to 16.65
Southern Coke, No. 4	15.90 to 16.40
Southern Coke, No. 1 Soft	17.15 to 17.65
Southern Coke, No. 2 Soft	16.65 to 17.15
Southern Gray Forge	15.50 to 16.15
Southern Mottled and White	15.15 to 15.40
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	17.30 to 17.80
Jackson Co. and Ky. Silvery, 6 % Silicon	18.80
Jackson Co. and Ky. Silvery, 8 % Silicon	19.80
Jackson Co. and Ky. Silvery, 10 % Silicon	20.80
Alabama Basic	17.65

Metals.—The market is quiet. Casting Copper, 16½c. to 16⅝c.; Lake, 16⅞c.; Pig Tin, car lots, 33c. to 33½c.; small lots, 34c. to 34½c.; Spelter, prompt delivery, 6.05c. for car lots; Lead, Desilverized, 4.95c.; Corroding, 5.05c. for 50-ton lots; on car lots, 2½c. per ton higher; Light Brass 7¾c. Sheet Zinc is $7.50, list, f.o.b. Lasalle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 14c.; Heavy Copper, 13¾c.; Copper Bottoms, 12¾c.; Copper Clips, 13¾c.; Red Brass, 12¾c.; Red Brass Borings, 10¾c.; Yellow Brass, Heavy, 9¾c.; Yellow Brass Borings, 7¾c.; Light Brass, 7¼c.; Lead Pipe, 4¼c.; Tea Lead, 4c.; Zinc, 4½c.; Pewter, No. 1, 21c.; Block Tin Pipe, 27½c.

(By Mail.)

Billets.—The Illinois Steel Company is now out of the market on Forging Billets and will be unable to again offer any tonnage in the open market until the seven Open Hearth furnaces now already under construction are completed. On account of the shortage of Steel at the South Works efforts will be made to complete this addition in record time and March has already been set as the date for the first cast. We quote Forging Billets, car loads, at $32 with the usual extras.

Rails and Track Supplies.—The bookings of standard sections have been very light during the week, especially as compared with the tonnage taken from week to week since September 1. Two orders aggregating 11,000 tons for delivery November, 1906, were closed. The demand for light Rails continues heavy, while the orders booked thus far this month for both Spikes and Track Bolts are double the company's output during this period. Quotations are unchanged as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 1.85c. to 1.95c.; Track Bolts, 2.40c. to 2.50c., base, Square Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30-lb. to 45-lb. Sections, $25.50; 25-lb. $26.50; 20-lb., $27.50; 16-lb., $29; 12-lb., $30; lighter Sections down to 8-lb., $35 to $38, f.o.b. mill. Standard Sections are quoted $28, f.o.b. mill, full freight to destination.

Structural Material.—The structural mill of the Illinois Steel Company will from present indications be placed in operation much sooner than anticipated, and the first Steel will probably be rolled early in November. Notwithstanding the early completion of this mill no contracts have yet been taken against its output, nor has any of the tonnage of the Carnegie Steel Company been diverted to this mill. The congestion at all of the mills continues and jobbers who can make prompt deliveries of assorted sizes are experiencing no difficulty in securing an average of 2¼c. to 2½c. For future delivery from mill we make the following quotations: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.86½c.; Angles larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending, or other shop work. Store prices on Angles, Beams and Channels range from 2.50c. to 3c., according to quantity on hand, in store, or obtainable from mill.

Plates.—While considerable lake boat business is still under negotiation no additional tonnage has been taken on from this source during the week. Current business is light, although specifications on old contracts thus far this month have been from 50 to 60 per cent. greater than the outputs of the mills. Prices are firm and unchanged as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16-inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality in widths up to 100 inches, 1.86½c.; base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16-inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.10c. to 2.15c; Flange quality, 25 cents extra

Sheets.—As practically all of the large buyers of Black and Galvanized Sheets have covered requirements at least to the end of the year, and in a few instances for a period of six months, the volume of new business that is being placed is comparatively light. Prices are firm, and 2.25c is now the well established minimum on Black Sheets 28 gauge. We quote the following prices: Blue Annealed, Nos. 9 and 10, 1.81½c. to 1.86½c.; Box Annealed, Nos. 18 and 20, 2.16½c. to 2.21½c.; No. 27, 2.31½c. to 2.36½c.; No. 28, 2.41½c. to 2.46½c., with the customary differentials between gauges. Store prices are 2c. to 2.10c. for No. 10 Blue, 2.05c. to 2.15c. for No. 12 Box, 2.10c. to 2.20c. for No. 14, 2.20c. to 2.30c. for No. 16, 2.40c. to 2.50c. for Nos. 18 and 20, 2.50c. for Nos. 22 and 24, 2.55c. to 2.65c. for No. 26, 2.60c. to 2.70c. for No. 27, 2.70c. to 2.80c. for No. 28, 2.95c. to 3.05c. for No. 30. Galvanized Sheets are quoted in car lots from mill at the following prices: No. 10, 2.36½c. to 2.41½c.; Nos. 17 to 21, 2.71½c. to 2.76½c.; No. 27, 3.26½c. to 3.31½c.; No. 28, 3.46½c. to 3.51½c. Store prices on Galvanized Sheets are firmer than for some time and high prices are being demanded for sizes difficult to obtain. Prices are as follows: Nos. 10, 12 and 14, 3.10c. to 3.20c.; Nos. 16 to 20, 2.90c. to 3c.; Nos. 22 to 24, 3c. to 3.15c.; No. 26, 3.20c. to 3.35c.; No. 27, 3.40c. to 3.55c.; No. 28, 3.60c. to 3.75c.; No. 30, 4.85c. to 4.95c.

Bars.—Iron Bars are now firmly established on the basis of 1.80c., f.o.b. Chicago, and considerable tonnage has already been placed for future delivery at this price. We also note the sale of 1000 tons of Steel Bars for early delivery at a premium of $2 a ton, or 1.60c., Pittsburgh. Notwithstanding the large contracts closed recently for Steel Bars the tonnage taken on thus far this month by several of the leading producers exceeds their output by fully 50 per cent. Specifications on business placed recently are unusually heavy and the mills are from three to four weeks behind on deliveries. We make the following quotations: Iron Bars, 1.80c.; Steel Bars, 1.66½c., both half extras; Hoops, 1.91½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—Deliveries now chiefly concern consumers who placed contracts during the summer months for their half year requirements. On Agricultural Shapes none of the mills is in a position to make immediate deliveries, several in the Central West having their output taken for a period of six months. On material for immediate delivery premiums are already being asked, but on deferred shipments the following quotations prevail: Planished or Smooth Finished is unchanged at 1.70c., base, Pittsburgh, and Iron finish up to 1½ x ½ inch is 1.65c., base, Pittsburgh; Iron finish 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 inch, 2c., Pittsburgh, and 1⅛-inch and larger, 1.90c., Pittsburgh. Other quotations remain unchanged, as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount on car lots and 45 per cent. in less than car lots, in base territory.

Merchant Pipe.—The continued fine weather throughout the West and Northwest has resulted in an unusually heavy movement of Merchant Pipe from jobbers' stocks. Little new business, however, is being placed with the mills at the present time, as all the buying for this period was done by the jobbing interests about a month ago. The new list recently promulgated is being well maintained, and reports that 81 per cent. off has been done at Pittsburgh in the last few days are unfounded. Current discounts to consumers from mill on Black Steel Pipe are 78.35 per cent. on the base sizes, ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.

Boiler Tubes.—Despite the large tonnage that the mills have on their books some shading has been reported this week in this market. The lower prices have been named

by a few dealers who covered their 12 months' requirements last spring, when low prices were prevailing. Mills generally are maintaining the prevailing discounts. Official discounts, f.o.b. Chicago, in car lots, are as follows: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.35. Store prices are unchanged as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
¾ to 3 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—The city of St. Louis will this week close for 5000 tons of Cast Iron Pipe, this being the largest municipal letting now in sight. On account of the favorable weather current business is heavy, although deliveries cannot be made before the middle of November. On current business prices are unchanged as follows, f.o.b. Chicago, per net ton: Water Pipe, 4-inch, $30; 6, 8, 10 and 12 inch, $29; over 12-inch, $28, with $1 extra for Gas Pipe. Very large municipal contracts are placed on a somewhat lower basis.

Coke.—Both Connellsville and Wise County Foundry Cokes and now selling on the basis of $5.50 to $5.65, Chicago, and individual cars of Connellsville Coke have sold as high as $3.25 at ovens, or $5.90, Chicago. Foundries generally are not buying for future delivery, but many of those having contracts are experiencing considerable difficulty in securing deliveries and are compelled to go into the open market to meet their requirements. Furnace Coke has also advanced and it is reported that one Connellsville producer refused to accept $2.80 at the ovens for delivery through 1906.

Old Material.—Railroad lists that have been issued this week dispose of only a very small tonnage, and the monthly list of the Illinois Central Railroad has not yet put in an appearance. It is well known that this company has been holding its Scrap for higher prices, but has been letting a small tonnage go from month to month. Six weeks have elapsed since the last list was issued, and the indications are that the company will now hold all its material until higher prices prevail. An anonymous circular letter was received last week by all the railroad purchasing agents and Scrap dealers calling attention to the fact that the Chicago and St. Louis markets were considerably lower than other markets. It was also stated that the leading largest Western consumers have formed a pool to bear the market. Contrary to the statements in this circular, all of the large Western buyers in this district covered much of their requirements during the summer months, when prices were from $1.50 to $2 lower than those now prevailing, one consumer alone having a stock of 65,000 tons. There have been practically no changes in the prices during the week and the buying has been almost entirely limited to small lots. The range of prices paid by large consumers to producers and dealers in carloads, f.o.b. Chicago, is as follows:

Old Iron Rails	$22.00 to $22.50
Old Steel Rails, 4 feet and over	15.50 to 16.00
Old Steel Rails, less than 4 feet	14.50 to 15.00
Heavy Relaying Rails, subject to inspection	26.50 to 27.00
Old Car Wheels	16.00 to 16.50
Heavy Melting Steel Scrap	14.50 to 15.00
Frogs, Switches and Guards	14.50 to 15.00
Mixed Steel	11.50 to 12.00

The following quotations are per net ton:

Iron Fish Plates	$18.50 to $19.00
Iron Car Axles	23.50 to 24.00
Steel Car Axles	17.50 to 18.00
No. 1 Railroad Wrought	17.00 to 17.50
No. 2 Railroad Wrought	16.00 to 16.50
Locomotive Tires, smooth	14.25 to 14.50
Railway Springs	14.00 to 14.50
No. 1 Dealers' Forge	14.00 to 14.50
Wrought Pipes and Flues	12.00 to 12.50
No. 1 Cut Busheling	12.00 to 12.50
Iron Axle Turnings	11.50 to 11.75
Soft Steel Axle Turnings	11.00 to 11.50
Machine Shop Turnings	11.00 to 11.50
Cast Borings	9.00 to 9.25
Mixed Borings, &c	9.00 to 9.25
No. 1 Mill	10.00 to 10.50
Country Sheet	8.50 to 9.00
No. 1 Boilers, cut to Sheets and Rings	11.75 to 12.25
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	11.50 to 12.00
Railroad Malleable	14.25 to 14.50
Agricultural Malleable	13.25 to 13.75

The Pennsylvania Car Wheel Company, Pittsburgh, Pa., has purchased a controlling interest in the Pennsylvania Malleable Company and the Central Car Wheel Company, whose plants are at McKees Rocks, Pa.

Reports are current that Frank Baackes, now general sales manager of the American Steel & Wire Company, has declared the presidency of the Republic Iron & Steel Company. It is probable that Charles S. Guthrie, who is heavily interested in the Republic Company, will take the management.

Philadelphia.

REAL ESTATE TRUST BUILDING, October 17, 1905.

The Iron and Steel markets have been very strong during the past week, but the feeling appears to be less excited than it was. This is not due to any unfavorable developments, but rather to the impression that enough material will be available to meet the increased volume of business which is confidently expected. Moreover, manufacturers are doing all they can to discourage speculative purchases, and as they are in fairly close touch with what their customers are doing it enables them to discriminate in regard to what business to accept and what to decline. Considering the vast volume of business that is in progress, it is remarkable how well prices have been kept in check, although there can be little doubt that advances in some of the finished products will be made at an early date. If moderation on the part of buyers can be maintained the next six months should be unusually satisfactory, as prices will be high enough to leave a good profit and yet low enough to make them reasonably safe against the reaction which is bound to come sooner or later. As a matter of fact, it is the opinion of the trade that any inconvenience which may arise from periods of scarcity will be due more to insufficient transportation than to an actual shortage of materials. If this theory is correct the fact of having bought heavily for forward delivery will not help the consumer in the least, and it might be an unfavorable condition if high priced orders were on the books, and which of necessity would have to be carried over until the strain on the railways was relaxed. There will most likely be plenty of material to go around, and the necessity for paying much higher prices is not apparent at the present time, although adjustments in certain lines will probably be made during the next two or three weeks.

Pig Iron.—The demand is very good, and prices are firm without going higher than they were a week ago. Sellers are disposed to limit the amount which they will quote on, as they have already about as much business as they are desirous of taking until more light can be had in regard to costs and on other matters pertaining to the situation. The high price of Coal and Coke and the prospects for transportation are likely to be serious problems during the winter months, so that for the present it is considered good policy to keep within safe limits in regard to further engagements. Happily it is not a question of getting business, nor is the question of prices a matter of serious difficulty, as more business could be had and higher prices would be paid, but producers want to be sure that they will be able to get what they buy and to deliver what they sell. With prospects of insufficient transportation, however, and with a possible shortage of Coal and Coke, the situation may become one of considerable embarrassment, to minimize which there is a disposition to have some margin to come and go on. This will be no hardship to consumers, for if Pig Iron can be produced in sufficient quantities it will be for sale, and if the supply should be unavoidably restricted consumers would have to do without it any way. It will therefore probably turn out that there is not much to be gained by crowding work upon manufacturers, who, of course, are always anxious for business when they are in a position to handle it, while, as we said before, circumstances might occur that would make it impossible to complete deliveries, no matter how full their order books might be. Sales have been on a fairly large scale, quite as large in fact as sellers desired them to be. The distribution of business has been fairly uniform, but Foundry and Mill Irons have assumed a greater preponderance than usual, Steel Making Irons having been comparatively quiet during the last few days. It is known, however, that there is a considerable amount of business waiting to be placed, and if makers would open their books indiscriminately it would not be long before everything was taken clear up to next summer, but, as we have already said, great care is taken in regard to how much they quote on, what price, and what delivery. This will do much to prevent irregularity and inflation, which the trade greatly deprecate. To-day's prices are not materially different from those of last week, although some quote 25c. more money, while there are very few sellers at the inside rates, but the range for Philadelphia and nearby deliveries would be about as follows:

No. 1 X Foundry	$18.00 to $18.25
No. 2 X Foundry	17.25 to 17.50
No. 2 Plain	16.75 to 17.00
No. 2 X Southern	17.50 to 18.00
Standard Gray Forge	15.75 to 16.25
Basic	17.25 to 17.50
Low Phosphorus	21.50 to 22.50

Sales of Western Bessemer have been made for delivery to a nearby mill at about $22.25. There is also a great deal of inquiry for Low Phosphorus Irons, but furnaces are so well sold up that it is difficult to secure such deliveries as are required. Southern Pig has been advanced to $14 basis for No. 2 Foundry.

Ferromanganese.—Prices have jumped to $58 per ton for 80 per cent. Ferro and hard to get for this year's delivery even at a still higher figure.

Ferrosilicon.—There is an active demand at about the following prices: 11 per cent., $27.50; 50 per cent., $95, and 75 per cent., $170 to $175.

Steel.—Mills have done a heavy business during the past week and are hardly able to make quotations on new business, although $28.50 to $29 are nominal quotations.

Muck Bars.—There is no demand at present, but prices are about $28 asked, f.o.b. cars seller's mill.

Plates.—The demand is very heavy and mills are crowded with work, with a great deal of inquiry for additional quantities. The car and locomotive shops are taking a great many orders for rolling stock to be delivered with all the dispatch possible, so that the demand for Plates is unusually large. Boiler shops, shipyards and other consumers in important lines are also very busy, so that the Plate mills are certain to be fully employed during the winter months. Prices are unchanged for the present, but an advance is expected at an early date. Meanwhile the following quotations are in force:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100 pounds extra.
3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G.	.15 "
No. 9, B. W. G.	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—There is nothing to be said more than has been said during the past several weeks. Mills are full of work for months, and anything for this year's delivery commands a premium of $3 to $5 per ton or more. Nominal quotations are as follows: Beams and Channels, up to 15 inches, at 1.83½c. to 2c., and a tenth more for large sizes, and about the same schedule for Angles.

Bars.—The demand for Bars is increasing, and while the nominal quotation is 1.63½c., it would be difficult to place even the most desirable class of business at less than 1.83½c. Some large sales have been made at the last named figure, but in several instances business for 1906 delivery has been declined at that figure. The situation appears to be very strong, and 2c. for Best Refined Iron is likely to be reached before there is any reaction. Steel Bars are also very strong, and while the nominal quotation is 1.63½c., it is almost impossible to get deliveries without paying the equivalent of the prices obtained for Refined Bar Iron.

Sheets.—The demand is heavy and orders for next year's delivery are coming in very freely. Prices are firm but are usually given as follows for good sized lots: 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

Old Material.—The market is very unsettled, but prices are strong, and in some cases they are materially higher. Steel Scrap is variously quoted at $16.75 to $18, but a good deal of business has been done at about $17, and that is probably as much as consumers are willing to pay, but the market is very changeable, and a price given to-day may be something very different a few days later. A fair average of bids and offers would, however, be about as follows:

Scrap Steel Rails	$17.25 to $18.00
No. 1 Steel Scrap	16.75 to 17.25
Low Phosphorus Scrap	21.50 to 22.50
Old Steel Axles	21.00 to 21.50
Old Iron Axles	27.00 to 27.50
Old Iron Rails	22.50 to 23.50
Old Car Wheels	17.00 to 17.50
Choice Scrap, R. R. No. 1. Wrought	22.00 to 22.50
No. 1 Yard Scrap	19.00 to 19.50
Long and Short	18.00 to 18.50
Machinery Scrap	16.00 to 16.50
Wrought Iron Pipe	16.00 to 16.50
No. 1 Forge Fire Scrap	15.00 to 15.50
No. 2 Light Ordinary	12.00 to 12.50
Wrought Turnings	14.50 to 15.00
Axle Turnings, Choice Heavy	15.00 to 15.50
Cast Borings	10.00 to 10.50
Stove Plates	13.00 to 13.50
Grate Bars	12.75 to 13.00

The stockholders of the American Locomotive Company at their annual meeting, October 17, elected C. A. Coffin, president of the General Electric Company, and E. C. Converse directors of the company. W. G. Hoadley and W. Seward Webb retired from the board.

At a special meeting of the National Association of Window Glass Manufacturers, held in Pittsburgh last week, the sliding scale of the window glass workers was signed for five years.

Pittsburgh.

PARK BUILDING, October 18, 1905.—(*By Telegraph.*)

Pig Iron.—The purchase of 40,000 tons of Bessemer Iron by the United States Steel Corporation at $15.50 for October and $16 for November Iron will no doubt have the effect of still further strengthening the Pig Iron market and incidentally the whole line of finished products. The large Pig Iron interests are now holding Bessemer and Basic at $16, Valley furnace, for November and December delivery, but there is more or less Iron in the hands of dealers and independent furnaces which can be bought at $15,75 and perhaps a little less. The tonnage of such Iron, however is relatively small and does not cut much figure in the market. We quote Bessemer and Basic Iron at $15.75 to $16, Valley furnace, the lower price being for small lots for prompt shipment. There is a moderate inquiry for Foundry and Northern No. 2 is firm on the basis of $15.75 to $16, Valley furnace. Sales of several fair sized lots are reported at these prices. Northern Forge Iron is held at $15, Valley furnace, and we are advised of a sale of 1500 tons at this price.

Steel.—The demand for Steel is exceedingly heavy and the supply is very limited. Bessemer Billets have advanced to $26, Pittsburgh, for reasonably prompt delivery. Open Hearth Billets are practically impossible to get and a mill that can spare some for reasonably prompt shipment can get almost any price it cares to ask. Forging Billets are $29 and higher, depending on specifications. Sheet and Tin Bars in random lengths were billed at $26 for this month's shipment to concerns that have contracts. It is said the price for November delivery will be advanced to $27, maker's mill.

Steel Bars.—In view of the fact that no advance was made on Tuesday in the price of Plates it is not likely there will be any advance in Steel Bars in the near future.

Coke.—Fancy prices are being paid for Connellsville Furnace and Foundry Coke for delivery in the first quarter and first half of next year. We are advised that Furnace Coke on contracts for first quarter has been sold as high as $2.90 to $3 a ton at oven, while 72-hour Connellsville Foundry Coke for the first quarter is reported to have sold as high as $3.50 a ton at oven. Coke makers will accept lower prices on Coke for the first half of next year than they will for the first three months.

(*By Mail.*)

As generally anticipated, the United States Steel Corporation has again come into the market as a buyer of Bessemer Iron and has bought 40,000 tons, half for October delivery at $15.50 and half for November shipment at $16, Valley furnace. The tonnage is understood to have been about equally divided between the Besemer Pig Iron Association and the Shenango Furnace Company. The fact that the Steel Corporation agrees to pay $16 for November practically establishes the market at that figure, and while it is possible that some Bessemer Iron could be had from dealers and outside furnaces at about $15.75, the amount of such tonnage is very small and cuts little figure in the market. Now that Bessemer Iron has squarely reached $16 at furnace it will probably mean that the large interests will try to hold the market at that figure and prevent it from going higher. With such excellent conditions prevailing in the Pig Iron trade, and in fact all along the line, it would be a serious mistake to have a runaway market, which is now threatened. In fact, it is not believed that the Steel Corporation will buy any more Iron if the price goes above $16 at furnace. The general market on both Bessemer and Basic has been rather quiet for the past two weeks, but whether this latest purchase of the Steel Corporation will bring in other consumers remains to be seen, for although there is a good deal of inquiry intending buyers are balking at the high prices being quoted. There is a moderate inquiry for Foundry Iron, but the large consumers are pretty well covered into next year. Prices are higher, and we quote Northern brands of No. 2 Foundry Iron for this year and first quarter delivery at $15.75 to $16, Valley furnace. It is possible that small lots for prompt delivery might be picked up at $15.50, Valley furnace, but this is doubtful. There is some inquiry for Forge Iron and Northern brands are firm at $15, Valley furnace. We note a sharp advance in the price of Ferro, which has touched $62, Pittsburgh, for December shipment.

Never before in the history of the trade have the railroads of the country been as large purchasers of Steel Rails, engines and cars as they are at present, and heavy contracts for railroad equipment will continue to be placed for some time ahead. Last month the Pennsylvania Railroad placed orders for 16,150 cars and is planning to place early orders for about 15,000 cars additional. That railroad will also place contracts for 525 more engines, 275 of which will be built at its own shops in Altoona, Pa., and the other 250 by the Baldwin Locomotive Works, Philadelphia. The Baltimore & Ohio placed orders some time ago for 12,000 cars and has just placed an order for 500 wooden coal cars with the American Car & Foundry Company. The Norfolk & Western Railroad is in the market for 3000

to 5000 coal and coke cars, while the Duluth & Iron Range road has placed an order with the Pressed Steel Car Company for 500 steel hopper cars, and the Duluth, Missabe & Northern Railroad has placed an order for 750 steel cars with the same concern. The Baltimore & Ohio is in the market for 71,000 tons of Steel Rails for delivery next year and contracts for these will likely be given out within a very short time. In spite of the large orders for cars and engines placed by the Pennsylvania, Baltimore & Ohio and other leading roads that enter Pittsburgh, a serious car shortage is developing in this city which promises to become more pronounced with the breaking up of the weather. Should the manufacturing plants in this district be driven during the winter months at their present high rate Pittsburgh will likely be confronted with the most serious car shortage in its history. It is clearly evident that the railroads have not kept up their equipment to meet the growing demands of Pittsburgh for shipping facilities. The efforts of the Pennsylvania and other roads to keep the Wabash out of Pittsburgh were certainly ill timed, and while the Wabash is now getting its share of heavy tonnage from Pittsburgh and is helping out to a considerable extent, yet without that road the situation would have been far worse than it is now. There is a crying need in Pittsburgh for additional railroad facilities and for more rolling stock to handle its immense freight tonnage more promptly.

Ferromanganese.—The situation in Ferro has become more acute and in the past week prices of English 80 per cent. for this year's delivery have advanced $5 to $6 a ton, and we can note a sale of 100 tons at $62, Pittsburgh, for December shipment. One leading importer is quoting $65, but this is believed to be above the actual market. There is very little Ferro to be had and dealers who have some in stock and can make reasonably prompt deliveries can get almost any price asked for it. It is probable that contracts for delivery in the first half of next year could be made at considerably less than $62, which is the minimum of the market to-day for November and December shipment.

Steel Rails.—The Baltimore & Ohio order for 71,000 tons for next year's delivery has not yet been placed, but is likely to be given out this week. Western and Southern roads have been heavy buyers of Rails in the past two weeks, placing over 200,000 tons. The Rail trade for 1906 promises to be a record breaker. We quote Standard Sections at $28 at mill. There is a moderate demand for Light Rails and prices are firm. We quote: 8-lb., $36 to $37; 10-lb., $32 to $33; 12-lb., $29 to $30; 16-lb., $27 to $28; 25-lb., to 45-lb., $26 to $26.50, all f.o.b. cars maker's mill.

Rods.—There is more inquiry for Rods than there is tonnage and Bessemer and Open Hearth Rods are firm at about $32, maker's mill. It is said that sime sellers are asking higher prices. We quote Open Hearth Chain Rods at $33, maker's mill.

Muck Bar.—There is a good deal of inquiry, and owing to the higher price of Forge Iron dealers are asking more money for Muck Bar. We quote best grades made from all Pig Iron at $28 to $28.25, Pittsburgh.

Skelp.—Prompt deliveries of Skelp are very hard to obtain, the mills being filled up with contracts on which buyers are specifying very freely. For ordinary widths we quote: Grooved Steel Skelp, 1.50c. to 1.55c.; Open Hearth, 1.55c. to 1.60c.; Sheared, $1 advance; Grooved Iron Skelp, 1.55c. to 1.60c.; Sheared, 1.65c. to 1.70c., maker's mill.

Plates.—The Plate mills are simply congested with tonnage and it is still coming in at a very heavy rate. A new seller of Plates in the market is the United Steel Company, at Canton, Ohio, which is prepared to furnish Universal Plates ⅜-inch thick and heavier, 15 to 40 inches wide, and in any lengths. Prices in force at this writing are as follows: Tank Plates, ¼ inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50
Shell Grade of steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—The American Bridge Company has taken contracts for Structural Steel for large office buildings in Chicago and San Francisco, the material to be rolled by the Carnegie Steel Company. A great deal of work is in sight and the leading Structural concerns are practically filled up until April of next year. Prices are very firm and on small lots of Structural Steel for prompt shipment premiums are being paid. We quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.70c.; Angles, 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—We note continued improvement in demand for Sheets, but while prices are firmer they are not as yet any higher. It is probable that the price of Sheet Bars to concerns which have contracts will be $27 for November delivery, and for this reason as well as the steadily expanding demand and an advance in price of Sheets of about $2 a ton is generally anticipated by the trade. Prices are firm and we quote: Black Sheets, box annealed, one pass through cold rolls. Nos. 22 and 24 gauge, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.25c.; No. 29, 240c., and No. 30 gauge, 2.50c. Galvanized Sheets are firm in price and we quote: Nos. 22 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.10c.; No. 28, 3.30c.; No. 29, 3.55c; No 30, 3.80c. We quote No. 28 gauge Painted Roofing Sheets at $1.60 per square, and Galvanized Roofing Sheets, No. 28 gauge, at $2.80 for 2½-inch corrugation. Jobbers charge the usual advances over these prices for small lots from store.

Iron and Steel Bars.—We note a continued heavy tonnage in both Iron and Steel Bars and prices are very firm. While nothing definite has been done, an advance of $2 a ton in Steel Bars may be announced at any time. A number of consumers whose contracts have run out have recently come in the market and paid the full price of 1.50c. for Steel Bars. We quote Iron Bars at 1.70c., Youngstown, or 1.74¾c., Pittsburgh, and Steel Bars at 1.50c., base, half extras, for carloads and larger lots.

Hoops and Bands.—Most leading consumers are covered by contracts on which they are specifying very freely and a moderate amount of new tonnage is being placed We quote Steel Hoops at 1.75c., and Bands to be used for cooperage purposes at 1.75c., the latter carrying full Hoop and Band extras. Bands for other than cooperage purposes are 1.50c., base, half extras, as per Standard Steel card. Above prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery.

Tin Plate.—The Tin Plate trade remains in practically the same condition as noted in this report last week. The large orders from the canning industry were placed some time ago, and little improvement in the demand can be reasonably expected until after the first of the year. We quote Tin Plate at $3.30 per base box, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. for cash in 10 days.

Merchant Steel.—Practically all the leading consumers are covered by contracts, but a fair current tonnage is being placed. Buyers are specifying very freely on contracts and the mills are filled up with work to February or later. Prices are very firm and we quote: Planished or Smooth Finished Tire is 1.70c., base, Pittsburgh, and Iron finish up to 1½ x ½ inch is 1.65c., base, Pittsburgh; Iron finish, 1½ x 1½ inch and larger, 1.50 base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 inch, 2c., Pittsburgh, and 1⅛-inch and larger, 1.90c., Pittsburgh. For other grades we quote: Smooth Finished Tire, 1.70c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.65c. to 1.70c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. The demand for Shafting is quite heavy, which we quote at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The demand continues heavy and several makers have advanced prices again 5c. per 100 lbs. in the past week. We quote Railroad Spikes at $1.80 to $1.85 per 100 lbs., maker's mill, but note that some makers refuse to sell at less than the higher price.

Spelter.—We note an excellent demand and prices are very firm. Prime Western grades of Spelter are held at 5.85c. to 5.90c., St. Louis, equal to 5.97½c. and 6.02½c., Pittsburgh.

Merchant Pipe.—Prices are distinctly firmer and tonnage being entered by the mills is heavier than for some time. In view of the expanding demand and the higher prices for Skelp an advance in Merchant Pipe by the leading mills before long would not be surprising. Discounts are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Blk.	Galv.	Iron. Blk.	Galv.	Consumers, carloads. Steel. Blk.	Galv.	Iron. Blk.	Galv.
	%	%	%	%	%	%	%	%
⅛ and ¼ inch	72	56	69½	53½	71	55	68½	52½
⅜ and ½ inch	76	64	73½	61½	75	63	72½	60½
¾ to 6 inches	80	70	78	68	79	69	77	67
7 to 12 inches	75	60	73	57½	74	59	72	56½
Extra strong, plain ends:								
⅛ to ⅜ inch	65	53	62½	50½	64	52	61½	49½
½ to 4 inches	72	60	69½	57½	71	59	68½	56½
4½ to 8 inches	68	56	65½	53½	67	55	64½	52½
Double extra strong, plain ends:								
½ to 8 inches	61	50	58½	47½	60	49	57½	46½

Boiler Tubes.—The demand continues very heavy and the large contracts for engines being placed by the Pennsylvania and other leading railroads indicate a very heavy consumption of Boiler Tubes through the winter months. Prices are very firm, discounts being as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ inches	41	44
1¾ to 2¼ inches	41	56
2½ inches	46	58
2¾ to 5 inches	53	64
6 to 13 inches	41	56

Coke.—It looks very much like a runaway Coke market and all kinds of fancy prices are being quoted on Furnace and Foundry Coke for delivery in first half of next year. The Pennsylvania Steel Company has bought the output of the Mount Pleasant Coke Company for first half of next year, the price being given as $1.80 a ton at oven. The Washington Coal & Coke Company has let a contract for the building of 300 more ovens, and it is very likely that other Coke concerns will also build more ovens on account of the enormous demand for Coke. A sale of a round lot of Connellsville Furnace Coke is reported at $2.75 a ton at oven. It is predicted that some furnaces that have not yet covered for their supply of Coke for next year may have to pay $3 a ton for it before they can get it. Most of the leading Coke companies have their entire supply sold for the first six months of next year and Coke for that delivery is very hard to find. We quote strictly Connellsville Furnace Coke at $2.60 to $2.75 a ton at oven and note that some sellers are asking higher prices. The minimum price of strictly Connellsville 72-hour Foundry Coke is $3 and some dealers are asking as high as $3.50 a ton at oven. The total output in the Upper and Lower Connellsville regions last week was over 360,000 tons, and Coke is being shipped as fast as it is being made. Up to this time the supply of cars for shipping Coke has been very good, but there is a shortage just now of cars for shipping Coal.

Iron and Steel Scrap.—Prices on all kinds of Old Material are exceedingly firm and demand is urgent. A local Steel concern that is usually a seller of Scrap in the open market now refuses to sell, but will trade Scrap for Pig Iron or Billets. The minimum price of Heavy Melting Scrap is $16.50, and some dealers are quoting $17 or higher. Other grades of Scrap are quoted as follows: No. 1 Wrought Scrap is $16.50; Cast Iron Borings, $9 to $9.50; Bundled Sheet Scrap, $14.25 to $14.50; Old Steel Rails, short pieces, $16; long pieces, $16.50; Machinery Cast Scrap, $15, and Cast Steel Scrap, $15.50, all in gross tons, f.o.b. Pittsburgh.

Goff, Horner & Co., Limited, Frick Building, Pittsburgh, have been appointed selling agents in the Pittsburgh district for the United Steel Company, Canton, Ohio, maker of Universal Plates, Sheet Bars, Forging Billets and Skelp. The United Steel Company will roll Universal Plates ⅜ inch thick and heavier, 15 to 40 inches wide, and in any lengths desired.

Cleveland.

CLEVELAND, OHIO, October 17, 1905.

Iron Ore.—The movement of Ore is hindered somewhat by a congested condition of the railroads both in the Northwest and on the south shore of Lake Erie. Shippers continue to use more freely their contract boats to the exclusion of the wild tonnage, which is finding profitable employment elsewhere on the lakes. To such boats as take wild cargoes rates remain unchanged at 75c. from the head of the lakes to Ohio ports, 70c. from Marquette and 60c. from Escanaba. Reports are still around and increasing that the price of Ore is to be advanced in the winter, some predicting a restoration of the schedule of two years ago. According to some estimates stocks on the docks next spring will be the largest in the history of the trade.

Pig Iron.—More furnaces have announced their withdrawal from the market on Foundry Pig Iron for the remainder of the year. This has had the effect of stiffening the price and opening the field here for the sale of Southern Iron, which is only slightly above the price now asked by the Northern furnaces. It is reported that very little Foundry Iron is on sale in this territory at $15.50, at furnace, for No. 2 for spot shipment, most of the furnaces holding for $16. Some are asking $16.50 for delivery the remainder of this year. Iron has been sold for delivery in the first quarter of next year at that figure. The Southern furnaces are, in the main, sold up, but one or two offered No. 2 Foundry in this market in the week at $12.50, Birmingham, to which is added $3.85 freight to Cleveland. That is on a parity with $15.50 Iron in the Valleys. The Cleveland furnaces are among those sold up for the remainder of the year. Steel making Irons are also stronger. It is reported that very little Basic or Bessemer remains for sale at $15.50 in the Valleys, most sellers asking $16. The prediction is made that within a week $16.50 will be the ruling price in the market. A few furnaces operating in this territory are in need of relining, and this operation may restrict the output temporarily. One factor contributory to the strength of the market is the constant advance in the price of Coke. The best grades of 72-hour Foundry Coke are now selling at $3.50, at the oven. Some sellers have advanced Furnace Coke to $3, while in some cases contracts have been made at $2.75.

Finished Iron and Steel.—The report that Plates would advance has brought about an increased demand, which has been met by a refusal on the part of the mills to take new contracts at the present time. The larger mills are sold up and cannot offer deliveries inside the next three months. A good part of the supply of Plates for Cleveland has come for the past month or two from the Eastern mills, which have not been so congested as those in the Pittsburgh district. The expectation is that the price of Plates will be advanced to a parity with Structural Steel, or 1.70c., Pittsburgh. The belief is freely expressed that the advance would not detract from the present heavy buying. Billets are reported scarce in all quarters. Difficulty is experienced in getting Forging Billets, and within the week some sales have been made at $31, Pittsburgh. In Bessemer Billets for rerolling indications are that mills are practically able to name their own prices. Fancy quotations have been heard, among them $28, Pittsburgh, for 4 x 4 inch. The market is more nearly represented by $27, Pittsburgh. The Sheet market continues to show improvement. The principal business is done out of stock, where price changes have not been reported. The market is still based on 2.05c. for No. 10 Blue Annealed, 2.55c. for No. 28 One Pass Cold Rolled and 3.55c. for No. 28 Galvanized. The Pipe market is also reported stronger. In the Structural trade continued stress appears. The buying movement for lake vessels is for the time being about at an end. The demand from the shipbuilding quarter is now largely on specifications, which continue large and urgent. The building contractors are buying from stock where that is possible, but in the main are patronizing the Eastern mills, which are asking premiums of $5 at the mill over 1.70c., Pittsburgh.

Old Material.—Buying during the week has shown improvement and prices are slightly higher in some places. A few lines still retain nominal quotations. The following represents the quotations of the dealers, gross tons: Old Steel Rails, $16; Old Iron Rails, $20 to $21; Old Car Wheels, $16 to $16.50; Heavy Melting Steel, $16. Net tons: Cast Borings, $9 to $9.50; No. 1 Busheling, $14 to $14.50; No. 1 Railroad Wrought, $16 to $16.50; Iron Car Axles, $21 to $22; No. 1 Cast, $14.50 to $15; Stove Plate, $11; Iron and Steel Turnings and Drillings, $11.

Cincinnati.

FIFTH AND MAIN STS., October 18, 1905.—(*By Telegraph.*)

Pig Iron.—The market continues to show considerable strength and is moderately active. It appears that in a general way the trade is fairly well covered for the remainder of this year, and even for the first quarter of next year. Shipments are said to be moving freely, and buyers are taking them as fast as received without any complaint. A great many furnaces, both North and South, are well sold up for the next six months, and as a matter of fact several of the larger Southern producers have practically withdrawn from the market altogether. Reports would indicate that a large tonnage of speculative Iron is quietly being put on the market, as spot Iron can be had in abundance and at prices slightly below schedule. Inquiry is reported as being generally confined to small melters, whose usual purchases are from a carload to 500 tons. Southern No. 2 is apparently well established on a $12.50, Birmingham, basis and a very large percentage of the sales made during the week have been at this figure. We have reports, however, of some spot Iron selling below this price, but still other sales have been made at prices slightly in advance over the ruling quotation. Northern Iron is very strong, and has made a slight upward move since our last report and is now said to be firm at $15.50 to $15.75, at furnace. Gray Forge is in moderate demand, principally in Eastern territory, with sales light in this section during the past week. We have reports of sales of Southern Foundry grades of 1200 tons, Louisville delivery; 800 tons, Cincinnati delivery, and 500 tons, Indianapolis delivery, each being on a $12.50 basis. La Fo-

lette Furnace is reported to be going out of blast this week for extensive overhauling and repairs, which will probably consume 60 days or more. Freight rates from Hanging Rock district to Cincinnati are $1.15, and from Birmingham $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15 25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	14.00 to 14.25
Southern Coke, Mottled	13.75 to 14.00
Ohio Silvery, No. 1	19.40 to 19.65
Lake Superior Coke, No. 1	17.15 to 17.40
Lake Superior Coke, No. 2	16.65 to 16.90
Lake Superior Coke, No. 3	16.15 to 16.40

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$18.75 to $19.00
Lake Superior Car Wheel and Malleable	18.25 to 18.50

Coke.—The demand greatly exceeds the supply obtainable, and the inability to make deliveries is becoming a source of much annoyance. The car situation is again causing a great amount of anxiety to all concerned and will probably grow worse as cold weather approaches. The best grades of Wise County, Va., Foundry are quotable at $3.25 with Furnace Coke reported scarce and strong from $2.50 to $2.60, f.o.b. ovens.

Finished Iron and Steel.—New specifications are said to be coming forward in a very satisfactory manner. The demand for Plates and Shapes is well maintained. Trade along all Structural lines is said to be unusually strong, with no indications of any change in sight. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—The market for this class of material seems to hold firm, running in parallel lines with the development in Pig Iron. Considerable tonnage has changed hands during the week, and the general feeling is one of strength. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $16 to $16.50 per net ton; No. 1 Cast Scrap, $13 to $13.50 per net ton; Iron Rails, $19 to $20 per gross ton; Steel Rails, rolling mill lengths, $14 to $14.50 per gross ton; Relaying Rails, 56-lb. and upward, $23.50 to $24 per gross ton; Iron Axles, $21.50 to $22 per net ton; Car Wheels, $15.50 to $16 per gross ton; Heavy Melting Scrap, $14 to $14.50 per gross ton; Low Phosphorus Scrap, $17.50 to $18 per gross ton.

C. J. Burton, for many years connected with Robert Field in the Pig Iron business in Cincinnati, has withdrawn to join his father, G. F. Burton of Springfield, Ohio, in forming the G. F. Burton Company, with headquarters at Springfield. The new organiation is an Ohio corporation, with an authorized capital of $25,000, and will continue the business of dealing in Pig Iron, Coke, Molding Sand and kindred products as formerly conducted by G. F. Burton.

New York.

NEW YORK, October 18, 1905.

Pig Iron.—There has been as active a movement in Pig Iron as the disposition of makers to limit sales has permitted. The inquiry continues large and the pressure to secure Iron is still heavy. Prices have advanced and the tendency is decidedly upward. Throughout this district, throughout New England and the western part of New York State the sales have been liberal in Foundry Iron. A good deal of Forge Iron has been taken in eastern Pennsylvania and some round blocks of Basic have been sold, with additional heavy business pending, which sellers may only take on a scale up. We quote for Northern Iron, tidewater delivery, No. 1 Foundry, $17.75 to $18; for No. 2 Foundry, $17.25 to $17.75, and for No. 2 Plain, $16.75 to $17.25. Southern Iron is quoted on the basis of $17.25 to $17.50 for No. 1 Foundry and $16.75 to $17 for No. 2.

Steel Rails.—It appears that about 125,000 tons in all, of the order for the New York Central and other Vanderbilt roads has been placed, and that the Steel Corporation and the Buffalo Rail mill have the bulk of this business. Something like 35,000 tons remains to be bought for the above roads. Pending business in Rails includes the Baltimore & Ohio order, which is expected to reach 75,000 tons. In the past week the Clover Leaf bought 11,000 tons, the "Soo" Line 6000 tons and the Western Maryland 3000 tons. Frog and crossing companies are making extraordinary provision for their next year's business. Their purchases in the past ten days have amounted to 50,000 tons, one company alone contracting for 30,000 tons.

Structural Material.—The week has added no large bridge or building contracts to the heavy tonnage already booked, though the amount of railroad bridge work recently figured on has reached high mark for an equal period of time. It is expected that the Astor apartment hotel will be let next month. It will occupy the block bounded by Seventy-eighth and Seventy-ninth streets and West End avenue and Broadway, in this city, and will require 10,000 tons of Steel. There is no present expectation of an advance in Structural Material, manufacturers being disposed to let the conditions with each mill govern in the making of individual contracts. A portion of a large contract made in this market the past week by an important consumer consisted of Angles and Channels, though the principal tonnage in a total of 75,000 for next year's delivery was Plates, Bars, Billets and Axles. We quote the following minimum prices for tidewater delivery on mill shipments: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. Beams 18 to 24 inches, 0.10c. extra; Angles over 6 inches, 0.10c. extra. Sales of Structural Steel out of stock have been made at 2.25c. to 2.75c.

Plates.—The manufacturers of Plates held a meeting in this city on Tuesday. It is understood that quite a number of those present favored an advance, but the majority decided that it would be better not to change prices at present. As the impression had gone out that an advance was very likely to be agreed upon, many local buyers made haste to get under cover, and a very large tonnage was placed under contract for future delivery. The quantity thus purchased comprises probably 25,000 tons. The Eastern mills will for the present take further orders on the basis of old quotations, but they are so well supplied with work that it appears to be only a question of a short time until premiums will be exacted on prompt shipments. Quotations at tidewater for shipment from mills are as follows: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 1.94½c. to 2.04½c.; Fire Box Plates, 2.04½c. to 2.60c., according to specifications.

Bars.—A meeting of Eastern Bar Manufacturers is being held in this city to-day, but at the time of going to press the result of the meeting had not been announced. The demand for both Iron and Steel Bars continues active and some important contracts were placed during the week, among them one for 2000 tons of Steel Bars. Steel Bars continue to be quoted on the basis of 1.50c., Pittsburgh, for forward delivery, which is equal to 1.64½c., tidewater, but premiums are being paid for prompt shipment. While a few Bar Iron mills may be found in a position to take a small amount of business at 1.60c., Pittsburgh, or 1.74½c., tidewater, the larger mills are refusing to sell under 1.84½c.

Cast Iron Pipe.—The city of Orange, N. J., will open bids next week for 4000 tons of 20, 24 and 30 inch Pipe. As the demand for these sizes has not been so heavy as for the smaller sizes, it is probable that competition will be quite keen. The volume of current business keeps up wonderfully well for so late in the season. Prices continue to be quoted at $27.50 per net ton for carload lots of 6-inch, at tidewater.

Old Material.—The market presents a number of interesting features. The demand for almost every kind of Old Material is good and prices are tending upward. Wrought Scrap is especially strong, with a general demand from consumers, some of whom desire extended deliveries to cover the winter. Steel Scrap has at last made an advance, and sales are reported of 2000 tons of Heavy Melting Scrap and 1000 tons of Old Steel Rails at prices a trifle higher than our minimum quotation. Holders of these classes of Material are not willing to accept anything like the prices quoted last week. Inquiries are in hand from four different consumers for blocks of 5000 to 10,000 tons of Steel Scrap, but as far as known none of these have succeeded in securing any part of what was wanted. The general opinion is that Steel Scrap will be much higher by November 1. Cast Scrap for foundry purposes is very active. It is stated that practically all the Heavy Cast Scrap and Stove Plate in stock in this vicinity has been placed under contract for delivery. Pipe Scrap is in demand, with little to be had at any price. A very heavy movement is noted in Malleable Scrap. Iron Rails are also in strong demand, but are hard to get. Among the sales reported for the week were 1000 tons of Cast Borings, 1000 tons of Heavy Cast Scrap, 1000 tons of Stove Plate, 500 tons of Car Wheels and 500 tons of Wrought Turnings. Dealers believe that with the winter months approaching, when the supply of all kinds of Old Material will be much less, as the railroad companies have disposed of their surplus Material and will have little to offer until toward spring, or four or five months hence, prices may be expected to advance materially. Quotations based on the conditions of the week are as follows for New York and vicinity, per gross ton:

Old Iron Rails	$21.50 to $22.00
Relaying Rails	24.50 to 25.00
Old Steel Rails, rerolling lengths	16.00 to 17.00
Old Steel Rails, Short pieces	16.00 to 16.50
Heavy Melting Steel Scrap	16.00 to 16.50
Old Iron Car Axles	23.00 to 24.00
Old Steel Car Axles	20.00 to 21.00
No. 1 Railroad Wrought	20.50 to 21.00
Iron Track Scrap	18.00 to 19.00
No. 1 Yard Wrought, long	18.50 to 19.50
No. 1 Yard Wrought, short	16.50 to 17.00
Wrought Pipe	15.00 to 15.50
Light Iron	11.50 to 12.00
Cast Borings	9.00 to 9.50
Wrought Turnings	12.50 to 13.50
Old Car Wheels	17.00 to 17.50
No. 1 Machinery Cast	14.50 to 15.50
Stove Plate	11.50 to 12.50
Malleable Cast	15.00 to 16.00

Metal Market.

NEW YORK, October 18, 1905.

Pig Tin.—Several influences have tended to give strength to this market. Although business was dull last week with the price about 32.20c., on Monday a good business was done on advancing quotations. On Tuesday the price further advanced, and to-day in sympathy with London cables New York brokers are holding spot Tin still higher at 32.60c. Shipments for November and December delivery are quoted at 32.40c. to 32.75c. In London the market is steady to firm, with spot Tin quoted at £148 17s. 6d. and futures at £141 5s. The strength in London apparently comes from delay in shipments from the East due to the blockade in the Suez. It is expected this will have some slight influence on the New York market. The arrivals during the last week were not as heavy as during the first ten days of the month. The total amounts to 1735 tons, and there are afloat for American ports 2130 tons. From the known movement of the metal afloat it appears that the reserve stocks will be drawn on before the end of the month. Notwithstanding that business is very dull in Pig Tin, business in some lines where the metal is used is reported as very active.

Copper.—There has been little or no business during the week. The interest in Copper is apparently centered in the market for standard warrants in London, which have steadily advanced, spot being quoted to-day at £72 10s. Futures are also higher at £71. Spot stocks in New York are held at about 16.62½c. for both Lake and Electrolytic, but some of the special brands which have been commanding considerable premiums during the last month are offered at a much less premium. There is apparently no business for future delivery, and consumers are holding off before covering their wants for the first few months of next year. The exports so far this month aggregate 9547 tons.

Spelter.—The principal news of the week comes from St. Louis in a report to the New York Metal Exchange stating that Spelter has been sold there for export to Europe. This report has later been confirmed. This feature of the trade is being closely looked into, and exporters here have gone so far as to obtain freight rates. Spot stocks in New York have advanced and are held at 6.10c. to 6.20c., with November and December shipments at the same price. The output of Ore is large and the Ore market has declined about $2 during the week.

Pig Lead.—Spot stocks of Lead are hard to obtain, the market being quoted at from 5c. to 5.50c. on the local Metal Exchange. For strictly spot delivery 5.25c. has been bid. The car shortage undoubtedly has had some effect on the market, but the consumption is very large and consumers are desirous of covering their requirements for the busy season. The American Smelting & Refining Company is only accepting orders for delivery at the price current on date of shipment. This is likely to discourage speculation and keep the trade in its legitimate channels. In St. Louis the market is quoted very firm at 4.95c. In London the market has again advanced, now being quoted at £14 18s. 9d. for Soft Spanish Lead.

Antimony.—The market is practically unchanged, Hallett's being quoted at 12.25c. to 12.50c.; Cookson's at 12.50c. to 12.75c.; other brands, 11c. to 12c.

Nickel.—There is a fair amount of business, consumption being large, but there are ample stocks to cover present requirements. Large lots are obtainable at 40c. to 45c.; smaller quantities at 50c. to 55c.

Quicksilver.—The price of $40 per flask of 75 pounds in 100-flask lots is still maintained. In San Francisco domestic orders are taken on a basis of $39, while the London market is likewise unchanged at £7 2s. 6d.

Tin Plate.—The situation at the mills is dull, but there is apparently a good consumption of Terne Plates. The principal producer continues to quote 100-pound IC Coke Plates on a basis of $3.49, f.o.b. New York, or $3.30, f.o.b. Pittsburgh. In Swansea Welsh Plates have advanced to 12s. 9d., due to higher prices of Pig Iron.

Iron and Industrial Stocks.

NEW YORK, October 18, 1905.

While the stock market still continues in a state of repression, owing to the high rates prevailing for money, the industrial stocks exhibit decided strength. In some instances advances are noted. Steel Foundries common moved up during the week ending Tuesday afternoon from 12¼ to 13½, and the preferred from 43½ to 45⅜; Pressed Steel common from 45 to 46⅝, and the preferred from 96¼ to 98; Republic common from 23⅞ to 26⅜, and the preferred from 92¾ to 96½; Tennessee Coal from 84¼ to 86¾; United States Steel common from 37 to 38⅛, and the preferred from 103½ to 105; Car & Foundry common from 36¾ to 38¼; Locomotive common from 59 to 61; Colorado Fuel from 44½ to 46½. Indications point to speculative activity in industrial stocks as soon as money becomes easier. Last transactions in active stocks up to 1.30 p.m. to-day are reported at the following prices: Can common 10¾, preferred 71; Car & Foundry common 38⅛, preferred 100; Locomotive common 63½, preferred 114½; Colorado Fuel 45¼; Pressed Steel common 46, preferred 98½; Railway Spring common 44⅞; Republic common 25, preferred 94½; Sloss-Sheffield common 70, preferred 122¾; Steel Foundries common 13⅛, preferred 45⅛; Tennessee Coal 85¼; United States Cast Iron Pipe common 37⅝, preferred 96⅞; United States Steel common 37¼, preferred 104.

Dividends.—American Shipbuilding Company, Cleveland, Ohio, has declared the regular quarterly dividend of 1 per cent. on the common stock, payable December 2.

National Steel & Wire Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock.

Henry R. Worthington has declared the regular semi-annual dividend of 3½ per cent. on the preferred stock, payable November 1.

Bethlehem Steel Corporation has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable November 1.

The International Steam Pump Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable November 1.

New York Pig Iron Warrant Market.

The first sales of pig iron warrants since the innovation of that style of trading in the Produce Exchange took place during the week ending at noon on Wednesday, when 100 tons of Alabama gray forge was sold at $11 and 100 tons of Alabama No. 2, November, was sold at $12.75. The sales of pig iron warrant certificates amounted to 600 tons, as follows: 200 tons October foundry, $16; 100 tons October regular, $15.95; 100 tons cash, $16; 100 tons October regular, $16.00; 100 tons November regular, $16. The following prices were established on call Wednesday noon: Warrants, gray forge Alabama $11 bid; $11.50 asked; Birmingham No. 2, $14 asked; Pennsylvania, tidewater, $17.50 asked. Pig iron warrant certificates.

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	....	16.00	....	....
October	$15.50	16.00	$15.60	$15.75
November	15.50	16.10	15.60	15.85
December	15.70	16.20	15.70	16.00
January	....	16.30	15.80	16.10
February	....	16.40	15.90	16.20
March	....	....	16.40	16.30

The Colorado Fuel & Iron Company,

The annual meeting of the stockholders of the Colorado Fuel & Iron Company was held in Denver, October 16. The following were unanimously elected directors for the ensuing year: Alvin W. Krech, Edwin Hawley, John H. McClement, Benjamin Nicoll, Willard P. Ward, Winslow S. Pierce, George J. Gould, E. T. Jeffery, E. H. Harriman, E. W. Oglesby, Edwin Gould, D. C. Beaman and F. J. Hearne. There was no election of officers, the matter being deferred by the directors until the meeting in New York this month.

The report of President F. J. Hearne for the year ended June 30, 1905, was submitted and shows the largest tonnage of coal ever produced by the company. The gross earnings from operations for the year were $18,615,017, an increase of $6,763,687, as compared with the preceding year. The net earnings carried to the credit of income account were $1,474,193, an increase of $1,306,876, as compared with the preceding year. The total net earnings from all sources amounted to $1,922,047. It is explained by the report that this total, after the payment of all fixed charges and sinking funds, "leaves a deficit of $341,922, carried to the debit of profit and loss."

The Machinery Trade.

NEW YORK, October 18, 1905.

The most interesting happening in machinery circles the past week was the convention of the National Machine Tool Builders' Association, which was held at the Hoffman House Monday and Tuesday. As many of the merchants in this city represent members of the association who are now here they have been pretty busy attending to a large volume of business and entertaining the visitors. A detailed report of the convention appears in another column of this issue.

The projected change in German tariff laws, which will add to the cost of exporting American machinery to that country, has attracted the attention of many American machinery houses as well as German interests that have heretofore imported machines and machine parts to that country from here. It is said that a deep rooted idea exists on the other side of the water to the effect that it will be profitable —to manufacture some machinery in Germany which has in the past been imported from this country, and a number of machinery houses in this country have received communications from German interests asking them to furnish prices of machines to manufacture goods that have heretofore been imported. Joseph L. Ullo, who represents the Berlin sales agency of Henry Bischoff & Co., 237 Broadway, New York, is representing German interests in a move of the kind mentioned and he is gathering together catalogues of manufacturers who make machinery to turn out automobile parts, gasoline engine parts, auto gear cutters and the like. He is not, however, specializing on those lines, but is busy collecting catalogues and price-lists on the products of about every line of American manufacture in the machine trade. He states that he represents German interests, but his principals wish to remain in the background for the present. It is their idea that it will be more profitable after the new tariff rates go into effect for German capital to manufacture certain lines of machinery products than to import them. If this is found to be true it is expected that there will be considerable purchasing done here by the interests he represents, although he is not at liberty to make an announcement to that effect as yet.

Machinery Requirements.

The Erie Railroad has completed the purchase of property in Jersey City for the proposed extension of its terminal there and all the difficulties that arose with the municipality have been settled. As a consequence it is expected that before long the work of the long projected improvements at that point will be begun. It is understood that in addition to other projects the company has under consideration the erection of a machine shop at Jersey City; also a repair shop and other buildings. If the present plans of the company are carried out a large amount of money will be spent for machinery at that point and the New York trade will be greatly benefited, as all of the buying will no doubt be done in this city. Officials of the road are not yet ready to announce just when the improvements will be begun, but it is understood that the engineering force of the road has been busy with plans for some time past.

Strenuous efforts are being made to improve the facilities for handling freight not only in the additional rolling stock but by improved machinery at the freight houses of the Pennsylvania Railroad, and to this end the purchasing department is now in the market for from one to five 10-ton locomotive cranes, the purchase of which will enable it to expedite the large business in and about the freight stations.

The trade is paying some attention to the purchasing department of the Delaware, Lackawanna & Western Railroad just at present, as it is expected that before long there will be a large list of machine tools in the market for the new Kingsland shops of the company. A large plant is being completed at that point, and it is understood that the company intends not only to repair cars there but will build them as well. It is said in the trade that no machinery has been bought as yet for the shops, and those who are following the matter up are looking every day for the appearance of a list of requirements.

It is announced that the Pratt & Whitney Company of Hartford, Conn., has purchased a plant in Dundas, Ont., for the manufacture of its full line of small tools—taps, reamers, milling cutters, punches, dies, &c. The building is a modern structure and the power plant is already in place. The machinery equipment is being gotten ready at Hartford and will be sent there and operations begun immediately. The plant, we are informed, will also include a department for manufacturing a full line of twist drills, an elaborate equipment of special machinery having been gotten ready for the purpose. The location of the factory is near that of the John Bertram & Sons Company, which, as has been announced, was recently purchased by the Niles-Bement-Pond Company.

It will not be long before the Kellogg-McCrum-Howell Company, 46 East Twentieth street, New York, will be in the market for a long list of machinery equipments for its new plant at Blairsville, Pa. The company, which makes radiators, furnaces, ranges and the like, has already begun to rebuild its plant, which was destroyed by fire some time ago, and the plant will be reconstructed on a much larger scale than it was before. The main factory and the adjoining buildings will be 102 x 350 feet and the plant will include a power house 60 x 96 feet and a milling room 40 x 60 feet. There will be a machine shop 50 x 257 feet, an enameling room 55 x 257 feet, and a warehouse 80 x 300 feet. It is expected that a power plant of from 250 to 300 horse-power will be installed, but that has not been entirely decided upon as yet. No arrangements have been made regarding the machinery and it is stated that those details will not be taken up as yet, but in three or four weeks the company will begin considering the matter. As practically all the machinery in the old plant was destroyed, the company will no doubt come into the market with a substantial list. Mr. Kellogg has personal supervision over the arrangements for the erection of the plant and he is attending to the details from the New York office of the company.

Plans and specifications are now being prepared by the Osborn Engineering Company, Cleveland, Ohio, for the new plant to be erected for the Connellsville Machine and Car Company at Connellsville, Pa. The new plant is to replace the one which was destroyed by fire some months ago and will undoubtedly necessitate the purchase of quite a good sized lot of machinery. While the Osborn Company's plans may include the purchase and installation of the power plant, it is thought the machine tool equipment will be purchased by the company from its Connellsville office.

Large punches, lathes and quite a quantity of other metal working machinery are required by the Empire State Engineering Company, 553 East 116th street, New York. The company has secured a plant in Rome, N. Y., which it is equipping for a general engineering business and for the manufacture of engines, &c. The plant, which covers three acres of ground and contains 82,000 square feet of floor space, is now being equipped, a part of the machinery having already been purchased.

The Proctor & Gamble Company, Cincinnati, Ohio, has purchased an extensive tract of land in Staten Island, where it intends to erect a large plant for the manufacture of soap.

In view of the fact that the National Enameling & Stamping Company, New York, will have to purchase considerable new machinery for equipping its new building it will be of interest to note that permits have been taken out for a building 79 x 206 feet. The building, which will be located at the corner of Creek street and Debevoise avenue, Long Island City, will be equipped to a great extent by machinery which will be moved from one of the company's present factories.

The Orient Steel Radiator Company has been incorporated under the laws of West Virginia, with a capital stock of $2,000,000, with Julian Kennedy, the prominent engineer of Pittsburgh, Pa., as one of the chief incorporators. While the plans of the company are not yet formulated, it is the intention to erect a large plant in the Pittsburgh district, to cost, we understand, in the neighborhood of $300,000. We are informed that the site for the new plant has not yet been selected. Associated with Mr. Kennedy in the enterprise are C. E. Safford, Reid Kennedy, J. W. Lee, Eugene Mackey, E. C. Converse and C. E. Bray.

The Pressed Steel Car Company, whose headquarters are in New York, has been buying considerable machinery of late for its plant at Kees Rocks, Pa., and it is understood that there are still some orders to be closed. Several large orders have been placed within the last few weeks and a Cleveland concern was awarded several thousand dollars' worth of business in one lump, it being the largest order recorded by the concern during the month.

Dealers in rolling mill equipment are still kept busy filling orders, not a few of which have been placed of late by the United States Steel Corporation. The activity in buying is particularly noticeable in the Pittsburgh district, where a number of plants are being overhauled and enlarged, and one New York house has recorded the largest month's business of the year.

A project that will entail the purchase of considerable machinery is that of the S. S. McClure Company, 44 East Twenty-third street, New York, to add to its plant at Long Island City by the erection of a publication building. The new structure will be about 100 x 260 feet, three stories and basement. O. W. Brady, business manager for the company, states that no decision has been reached as yet regarding what machinery will be installed, and those details will be taken up later on.

The Jucaro & Moron Sugar & Land Company has been incorporated under the laws of New Jersey, with $3,000,000 capital, for the purpose of operating a sugar plant in Cuba along the lines of the Jucaro & San Fernandon Railroad. The interests of the new company are closely allied with those of the railroad, and it is expected that a number of refineries will be erected before long. It is understood that the company expects to develop large sugar plantations and has arranged already with a contracting firm for a large sugar plant. Similar projects are in view along the line of the railroad, which passes through a rich sugar and fruit pro-

ducing section. The incorporators are: G. W. Ireland of Philadelphia, William B. Symmes, 52 Broadway, New York, and J. R. Besson of Jersey City. Mr. Symmes, to whom inquiries can be addressed, states that the company is not ready as yet to make a full announcement of its plans, but it is expected that before long the trade can look for some purchases of sugar mill equipment.

McClave, Rimmer & Co., 85 Liberty street, New York, has been awarded a contract by the William Peters Brewing Company, Hoboken, N. J., for a 60 horse-power engine direct connected; 60-kw. dynamo, Liberty Silk & Dyeing Company, Allentown, Pa., and a centrifugal pump and a 75 horse-power motor, Lehigh Valley Coal Company.

The Commissioner of Water Supply, Gas and Electricity, New York, will receive bids until November 8 for furnishing four water tube boilers at the new Ridgewood pumping station, Brooklyn.

Chicago Machinery Market.

CHICAGO, ILL., October 17, 1905.

The demand for wood working machinery, which has been much smaller than for iron and steel working tools during the past two months, has shown material improvement. The entire equipment of several large plants is now under negotiation, and among them is the new plant of the Brunswick-Balke-Collender Company which is under erection at Muskegon, Mich. The Liquid Carbonic Company of this city, now moving into the old Western Steel Works plant on the north side, is also greatly adding to its equipment. The International Harvester Company continues a heavy buyer of small machine tools and there is no falling off in the sales from stock. Manufacturers of lathes, planers, drill presses, engine lathes and boring mills are unable to make deliveries in less than from two to three months, and second-hand tools consequently continue in big demand and high prices are ruling. On desirable tools dealers are securing prices only 25 to 30 per cent. lower than those for which the new tool could be bought. Nor is the supply of second-hand machinery very diversified at the present time on account of the heavy movement during the past two months, and manufacturers having second-hand equipment at their disposal are holding for higher prices. Builders of cranes are gradually catching up on orders, and the amount of new equipment that is being placed is not as heavy as during the earlier months of the year. Despite the heavy demand engines of all kinds continue low in price, undoubtedly due to the keen competition now existing among the large manufacturers.

The Miners Foundry & Supplies Company has been incorporated at Carterville, Mo., with a capital stock of $50,000, the following being incorporators: Chas. P. Wallace, O. H. Schoenherr and W. B. Kane of Carterville and M. R. Lively of Webb City, Mo. The company will build a new foundry and equip it with a 10-ton cupola, making provision for the addition of a similar sized cupola if desired later. Cranes, traveling trolley, ladle, &c., will be installed. The company is in the market for a complete equipment, with the exception of shafting, pulleys and power.

The Emerson Mfg. Company, builder of plows, harrows and other agricultural implements, Rockford, Ill., is putting up a one-story blacksmith shop, 104 x 527 feet; manufacturing building, 75 x 450 feet, three stories, and a power house of 800 horse-power capacity. Other buildings will be added as required.

The Marshall & Huschart Machinery Company, 62 and 64 South Canal street, Chicago, has added to its present showroom another store, which was formerly occupied by Whitman & Barnes, 66 Canal street. The general offices of the company, which now occupy a portion of the second floor, will be removed to the first floor, where they will be consolidated with the small office now on this floor. The second floor will then be entirely devoted to small machine tools, and the addition of the new storeroom will greatly increase the first floor showroom, which is devoted to the larger tools.

The South Park Commissioners, Chicago, will receive bids at their office at Fifty-seventh street and Cottage Grove avenue until October 25 on the following machinery for installation in the power house in Washington Park: One cross compound condensing engine for direct connection to a 1000-kw. generator, one cross compound condensing engine for direct connection to a 500-kw. generator, one 1000-kw. three-phase 60-cycle alternating current generator, one 500-kw. three-phase 60-cycle alternating current generator, two 350 horse-power water tube boilers, automatic stokers and superheaters, one 1000-kw. three-phase 60-cycle turbo alternator and one 500-kw. three-phase 60-cycle turbo alternator.

The National Medical University, Chicago, is in the market for a 25 horse-power gasoline engine for electric lighting and for a boiler of about 1000 feet radiation for its steam heating plant.

Plans and specifications are now being prepared by Holabird & Roche, Chicago, for the new Cook County Building, which is to be erected at a cost of $3,500,000. The power equipment for the building, including engines, boilers, &c., will be large.

The trustees of the sanitary district of Chicago opened bids October 11 on the electrical apparatus and materials for the power house at Lockport, Ill., and for the transmission lines along the right of way to the sanitary district of Chicago. Bids were received on the different specifications from the following firms: Manning, Maxwell & Moore, Wellman-Seaver-Morgan Company, Chicago Edison Company, Case Mfg. Company, Niles-Bement-Pond Company, Whiting Foundry Company, Westinghouse Electric & Mfg. Company, Crocker-Wheeler Company, Aermotor Company, Pawling & Harnischfeger, Northern Engineering Works, General Electric Company, Porter & Berg, Challenge Company, Brennan Electric Company, American Insulated Wire Company, Franklin Rolling Mill Company, American Electric Works, Stanley Mfg. Company, W. R. Gaston Company, Standard Underground Cable Company, Arthur Frantzen Company, John A. Roebling Sons Company, Western Electric Company and Pittsburgh Reduction Company. The Western Electric Company was the only firm to offer a bid for all the work, but its bid of $300,000 was about $8000 higher than the lowest bids from individual firms. The bids were referred to the Engineering Committee to be passed upon at its next meeting.

Cincinnati Machinery Market.

CINCINNATI, October 17, 1905

Judging from all we can learn there appears to be no falling off in the demand for tools of all kinds, and all the shops are as busy as they have been at any time during the year. Foreign trade is a very important factor in the shipments that are being made, and is said to be increasing. A great deal has been said about the Russian reciprocity treaty that it is understood is in effect, and which will so reduce the duty on American imports as to allow the machine tool builders of this country to compete with European countries in general. There seems, however, to be an uncertain element in this matter, and it would appear that there was another side to the matter. In talking with Mr. Lodge, of The Lodge & Shipley Machine Tool Company, on this subject he said: "The new duty which went into effect in consequence of the Japan-Russia peace treaty has been misconstrued, giving the impression that the concession made by Russia to this country was much more important than it really is. As a matter of fact, the reduction of the duty is not so important as the general reader would suppose from reports. It is true that, commencing on the 15th day of September, the duty on American machines has been reduced from Rubel 3.31½ to Rubel 2.14 per pud. However, this rate will only hold good until the new duty tariff between Russia and Germany will go into effect. Most probably this will happen in the months between January and March of next year, and then the duty on American machines will be raised to Rubel 4.20 per pud, which means Rubel 0.89 per pud higher than it has ever been before. You will see that under the circumstances the advantage of the Russian concession lasts only a short while, and then a duty much higher than the old one will take effect. However, my informant, who is thoroughly posted on the subject, says that notwithstanding this increase, an advantage will arise to this country from the fact that a duty will be paid on German machinery of exactly the same amount, viz: Rubel 4.20 per pud, as on American machines, and the result will be that the German competition will not be felt so keenly as before."

The Houston, Stanwood & Gamble Company has completed its re-organization. The officers are as follows: Charles R. Houston, president and general manager; James B. Stanwood, vice-president and engineer; H. M. Houston, secretary, and C. F. Houston, treasurer. The company has disposed of almost its entire issue of preferred stock. It has contracted with the Stewart Iron Works, of Cincinnati, for a building for its boiler department, to be of structural iron, 140 feet wide and 340 feet long. The company is now in the market for a complete outfit of up-to-date boiler makers' tools, consisting of rolls, punches, shears, rivetor, air compressor and traveling cranes. It reports sales very good.

The Lodge & Shipley Machine Tool Company has recently extended its works by enclosing more yard room and erecting thereon electric traveling cranes for the handling of lathe beds, so that beds of all sizes and lengths may be carried in stock, both finished and in the rough. This company is the undisputed largest manufacturer of lathes exclusively, in the world, so far as output in dollars and cents is concerned. Jacob Dietz, who formerly superintended shop No. 2, recently retired from business, and shop No. 2 is now under the direct management of the Lodge & Shipley Machine Tool Company. It has recently installed a new 400 horse-power Greenwald-Brown engine, direct connected to a Triumph Electric Company generator, and the power house, when completed, will be one of the models of nicety in this section. The company is fortunate in

having secured at the outset a sufficient amount of ground and still has 5 acres unoccupied, which in the course of time will no doubt be utilized. The plant, when completed, will consist of one building of steel and brick construction, 90 feet wide in three equal spans 1000 feet long, and another building 110 feet wide, the same length, intended to embrace a complete power plant and modern foundry. These latter improvements are, however, to be added sometime in the future. Trade is reported as exceptionally good both at home and abroad.

The Cincinnati Punch & Shear Company says it has enough work ahead to run it throughout the remainder of the year. It is bidding on some large contracts that it hopes to secure, in which event it will be well taken care of for months to come. Trade is said to be general from all sections.

The Industrial Bureau is still negotiating with a steel castings plant that it hopes to secure for the city. Conditions are more favorable than ever for the consummation of the deal, and it now looks as though it would be but a short time before all is settled. The machine tool people of the city realize the wisdom and necessity of securing a plant of this nature and are doing all in their power to bring it to pass. Daniel Donnelly and several other capitalists of Loveland, about 20 miles outside of the city, have purchased ground and formed a company and will begin the erection of a steel castings plant. Members of the Industrial Bureau on October 24 will visit the new dam at Culloms Riffle, going from thence to the plant of the United States Cast Iron & Pipe Company at Addyston. From there they will go to Norwood and visit the large plants in this section. It is expected that this trip will result in benefit to the manufacturing interests of the city, as they will at this time look over the ground thoroughly with a view to the location of several new industries that are now occupying the attention of the bureau.

The Rathbun-Lacy Company, Toledo, has been incorporated with $30,000 capital by Edward Rathbun and others. It has purchased a site and will erect a building, where it will manufacture marine gas engines.

New England Machinery Market.

WORCESTER, MASS., October 17, 1905.

New England is suffering from a congestion of freight due to the scarcity of freight cars. Raw materials are slow to arrive after being shipped, and as no orders for these materials are shipped promptly the additional delay is the more aggravating. The same thing is true of shipments from New England, it being difficult at times to obtain the necessary cars with desired promptness. Terminal facilities are better than ever before, the last period of abnormal congestion having had its effect. This is true of the smaller manufacturing centers as well as the cities. But these improvements are not completed, and some of the important terminal freight points will be unable to satisfactorily cope with business if industrial conditions continue to improve as at present. The New York, New Haven & Hartford Railroad, which is the most important of the freight lines in handling the manufactured products of New England, has very materially improved its facilities, especially in some important centers which have hitherto been neglected, notable among these being Waterbury, Conn., and other places in the Naugatuck Valley.

The important announcement is made in connection with the discussion concerning machine tool prices that the Brown & Sharpe Mfg. Company, Providence, R. I., has advanced prices upon all of its standard lines of machinery. The milling machine list has gone up from $50 to $75, which is an increase of approximately 10 per cent., the amount in dollars varying with the size and type of machine. The other lines of machine tools manufactured by the company have been advanced correspondingly. The announcement is the more interesting from the fact that the Brown & Sharpe Mfg. Company is not a member of the National Machine Tool Builders' Association, its action being entirely independent of any general agreement.

It is announced that the Cincinnati Milling Machine Company has made an advance on its milling machines corresponding to that of Brown & Sharpe, of from $50 to $75, and it is generally presumed that other builders of milling machines will follow along the same general scale of prices. But as yet no general advance has been made. One New England manufacturer of milling machines has not yet reached a decision on the question. But it is believed to be only a question of a few weeks, or perhaps days, when the general schedule of all the prominent manufacturers of this type of machine will have been advanced to the higher scale.

The Whitcomb & Blaisdell Machine Tool Company, Worcester, Mass., has purchased the business and plant of the Draper Machine Tool Company of that city and will absorb the business, the Draper Company going out of existence. The Draper shops and those of the Whitcomb works of the Whitcomb & Blaisdell Company are on adjoining property on Gold street, so that the two plants may be economically conducted together. J. W. Carrel, president of the Draper Company, will sever his connection with the company. Charles E. Thwing, treasurer of the company, will have a position with the Whitcomb & Blaisdell Company. The Blaisdell and the Draper lathes have hardly come into competition, the latter going into larger sizes, so that the continuation of the manufacture of the Draper machines by the new owners will be merely extending the Blaisdell line into larger sizes. The new combination under a single ownership is especially interesting, as it follows hard upon the combination of the Whitcomb Mfg. Company, manufacturer of planers, and P. Blaisdell & Co., manufacturers of lathes and other machine tools, and the Whitcomb Foundry Company. There will be no necessity in changing the *personnel* of the board or officers or increasing the capital stock of the Whitcomb & Blaisdell Company, the capital being ample to conduct the business with the additional capacity and product.

The Draper Machine Tool Company has a long history which covers much of the period of the development of the machine tool industry in Worcester as well as in the country at large. The business was established in 1845 by S. C. Coombs & Co., which firm conducted it for some years until changes in ownership altered the name to Shepard, Lathe & Co. In 1861 the withdrawal of the senior partner brought with it a change to the name of Lathe & Morse, later the Lathe & Morse Machine Tool Company. Edwin A. Thwing, the father of Charles E. Thwing, entered the business in 1871, and was an important factor in the management until his death in 1892, when the business was incorporated as the Draper Machine Tool Company, the name being for Gen. William F. Draper of Hopedale of the Draper Machine Works, who held a large part of the stock. Two years ago a reorganization was effected, J. W. Carrel, who had been with Hill, Clarke & Co., entering the business, taking the presidency and the sales end of the management.

Landers, Frary & Clark, hardware manufacturers, New Britain, Conn., have begun the erection of a new brick foundry. The building will adjoin the cutlery works of the company and will be two stories, 100 x 350 feet, in the form of a cross. It will be served by a side track.

Philadelphia Machinery Market.

PHILADELPHIA, PA., October 17, 1905.

Orders are coming out much more promptly, and an improvement in all branches of the trade is noticeable. The demand for heavy tools has been more active, and sales of a number of large lathes, drills and boring mills as well as special tools have been made. The smaller machine tools have also been in good demand, but not as much business has been taken in those lines during the past week as has been done in the heavier classes of both tools and machinery.

The greater part of the business placed has been made up of a number of small orders for a few tools for replacement or extension, no large equipment for any one concern being on the market, although it is quite probable that one right fair proposition will develop at an early date. The railroads, which have some good specifications already on the market, seem to be rather backward in closing up orders for machine tools, and during the past few weeks but little business has been received from those sources.

Some further orders have been placed by automobile repair shops, but they have nearly all been for small tools.

The principal factor against the ready sale of tools and machinery at this time is the inability of manufacturers to make good deliveries. Sales have in a number of cases been turned down inasmuch as the delivery of the tool could not be made for a period of from 30 to 90 days, varying according to the particular tool desired. These delays are largely unavoidable on the part of the tool builders, who in a majority of cases have enough work on their books to enable them to run their plants at full capacity well into the coming year.

Delayed deliveries on the part of machine tool builders has materially aided the business of the second-hand machinery merchants, who have noted an increased demand for all classes of tools, from which considerable business has resulted.

Foreign trade continues to improve. While the forward movement is not rapid nor assuming large proportions, there appears to be a gradual steady growth in the demand for various classes of machinery and tools. Manufacturers, as a rule, are not pushing this trade very extensively at this time, as with the large domestic demand it would be almost impossible to take care of a large quantity of business for export unless on extended deliveries.

Foundries, both gray iron and steel, continue uniformly busy. In some cases they have so much work on hand that prompt deliveries are hard to get. Others, however, could

handle greater tonnage and competition on some classes of work is very sharp.

Bids for the erection of a power house, an electric generator, engines, boilers, motors, &c., for the State Hospital for the Insane, at Danville, Pa., will be received by the Building Committee of the institution until October 27, 1905. Plans and specifications for same may be obtained from Philip H. Johnson, architect, 1826 Land Title Building, Philadelphia, Pa.

The Baldwin Locomotive Works has decided to use the proposed new building at Seventeenth and Buttonwood streets entirely for electrical work, the first floor being used for general storage purposes; the second and third floors for the manufacture of electric trucks, and the fourth story for storage of electrical supplies. Work on the new building is to be started as soon as the necessary formalities can be concluded. This company has taken some good orders for locomotives during the past week, including one for 250 for the Pennsylvania Railroad, to be delivered during 1906, and another for 50 of the Prairie type for the Chicago, Burlington & Quincy Railroad. All departments of the Baldwin Works are being operated at their full capacity, and work on the order books is sufficient to keep them busy well into next year.

H. B. Underwood & Co. are busy in all departments. There has been a good demand for their various portable shop tools, and orders have been taken for portable cylinder boring bars, portable valve seat rotary planing machines and portable milling machines. A number of these tools have been shipped to the various shops of the Pennsylvania Railroad and other railroad shops in the Middle West. A portable boring bar has also been exported to parties in Cuba, and a portable drilling machine has been furnished parties in the Central West.

Dienelt & Eisenhardt, Incorporated, have been receiving a large number of orders for hydraulic jacks from the various railroad companies, particularly for the larger sizes, such as 25 and 30 ton car box jacks, sales of which have been increased largely over those of last year. In their foundry department they keep uniformly busy, having a large quantity of work on hand for the New York Shipbuilding Company, Camden, N. J. They also find a good demand for their line of Monarch generators and motors, which they are rapidly extending so as to take in a greater range of sizes and capacities. All departments of their plant are busy and continued active conditions are being looked forward to.

The E. H. Mumford Company, manufacturer of foundry molding machines, has received a number of orders for split pattern machines, using its new vertical vibrator principle, from parties using other types of machines, and notes an increased demand for both the above and the power ramming machines. The past few weeks have been the best the company has had in point of deliveries, which include among others two 12-inch plain power ramming machines with vibrators for a local concern and another of the same size to New York parties. Several split pattern machines have also been shipped customers in different sections of the country.

The Energy Elevator Company notes a greater demand for its various lines of elevators, particularly from the out of town territory, and all departments of the plant are busy. This company has recently installed a heavy electric freight elevator for Ebeling & Reuss, and another for Edw. Sadtler, both of this city. A hand power passenger elevator has been finished for parties in Rosemont, Pa., as have also freight lifts for the Pennsylvania Railroad at Wilmington, Del., and for the Home of Aged Women at Norristown, Pa. Freight elevators have also been shipped parties in Terre Haute, Ind.; Knoxville, Tenn.; Salisbury, Md.; Providence, R. I.; Northampton, Mass.; Shreveport, Ill.; Owensboro, Ky., and other places.

The Alfred Box Company finds both inquiries and orders for cranes of different types quite numerous, and is busy in all departments. Recent orders include two 25-ton three-motor electric traveling and two hand power traveling cranes for the new power station of the Rapid Transit Company at Eighth and Sansom streets. A 10-ton three-motor electric traveling crane has been ordered by the Bernstein Mfg. Company for its new foundry addition in this city, and a special 5-ton three-motor electric traveling crane, 78 feet span, will be furnished Henson & Pearson of this city for handling lumber. Among the recent deliveries made by the Box Company may be mentioned a 30-ton electric traveling crane, 82 feet span, installed at the Lardners Point Pumping Station for the city of Philadelphia; a 10-ton three-motor electric traveling crane for the Fairmount & Parkesburg Traction Company, Fairmount, W. Va.; two 5-ton hammer cranes for the Richmond, Va., plant of the American Locomotive Company; special hand jib crane for the Crocker-Wheeler Company, Ampere, N. J., and a 5-ton three-motor electric traveling crane for the General Electric Company, Schenectady, N. Y. Six Box mechanical stokers for 250 horse-power Babcock & Wilcox boilers, have also been furnished the New York City Railway for its Ninety-sixth street power station.

Cleveland Machinery Market.

CLEVELAND, October 17, 1905.

Machinery dealers and manufacturers as a rule report that business continues to improve and that October will be heavier than the preceding month. The dealers say that comparatively little of the business is coming from Cleveland itself, but rather it is coming from all over the district tributary to this city. There are many orders and inquiries from smaller classes of concerns which are improving and enlarging their facilities and replacing old machinery with modern high speed outfits. The difficulty of securing deliveries is becoming worse. One leading dealer stated that he was accepting no orders on standard modern tools for deliveries this year, the earliest guarantees being along in February and March. On the largest sizes of tools some of the factories have sold up to the fall of 1906, and certain tools can not be secured within a year. Retail stocks have become badly depleted, a remarkable contrast to a few months ago, when some of the stores were loaded with stock. Prices on certain lines of tools are showing indications of further advances, one large Cincinnati maker announcing this week an advance of 10 to 15 per cent. on all tools.

The Mineral Ridge Mfg. Company, Mineral Ridge, Ohio, which is erecting a large shop, has been buying quite a large assortment of medium size and large tools, the orders being distributed among four Cleveland dealers.

The National-Acme Mfg. Company, which, as stated in another column, is preparing to erect a large addition, will install a considerable amount of new machinery. The contemplated improvements will give this company perhaps the largest machine tool plant in Cleveland.

The Baltimore & Ohio Railroad has been making inquiries on considerable new equipment to be installed in the new shop at Lorain, Ohio, contract for the erection of which was closed two weeks ago.

The Brown Hoisting Machinery Company has just made shipment of eight carloads of material for large work which it will install for the Panama Canal Commission. It will include a large cantilever crane, a large locomotive crane and coal hoisting machinery for the docks at the terminals.

Foote-Burte & Co., manufacturers of multiple drilling machines, have experienced a slackening of railroad business, which has been very heavy the past few months, but in place there is a pronounced improvement in general business from all parts of the country. The automobile business is furnishing a number of good orders, several large tools having recently been shipped to the Cadillac Company at Detroit and others to the Royal Motor Car Company, Cleveland.

Last week the Wellman-Seaver-Morgan Company made shipment of a large amount of machinery for the manufacture of steel to Shanghai, China.

The American Cereal Company, Akron, is erecting a large power plant in that city. Four 350 horse-power Sterling boilers are to be installed and there will be individual steel stacks 190 feet tall. The company is planning to install electrical equipment to supersede the present system of belt drive.

The Diamond Portland Cement Company will make important improvements at its Middlebranch, Ohio, plant, including the erection of a concrete building 30 x 160 feet, the installation of grinding machinery and presses. Two 80-foot kilns will be furnished by the Bonnet Company, Canton.

The American Iron & Wire Mfg. Company, Canton, is erecting a two-story shop, 40 x 100 feet. The company manufactures fire escapes, balconies, stairways and other structural iron work of similar nature.

The McMyler Mfg. Company, Warren, builder of hoisting and conveying machinery, is improving its facilities and is now employing 200 men. The Company recently shipped a large car crane to the New York, New Haven & Hartford Railroad.

The Curtis Machine Company, Canton, manufacturer of ice machinery and refrigerators, has submitted a proposition to the Chamber of Commerce, Elyria, Ohio, to locate a factory in that city.

The Rathbun-Lacy Company, Toledo, has been formed by V. E. Lacy, Jr., Frank H. Lacy, Edward Rathbun, W. L. Lamb and others. The company has a capital stock of $30,000, and it proposes to manufacture marine and automobile gas engines from 3 to 15 horse-power in the two-cycle type and 15 to 100 horse-power in the four-cycle type. Edward Rathbun and V. E. Lacy, who will be the active men, have had long experience in this line.

The Board of Public Service of Newark, Ohio, has awarded a contract to the American Light & Water Company of Kansas City, Mo., for the erection of a municipal water works system, including a pumping station and 25 miles of mains. The company's bid was $266,843. A filter system will be installed provided a bond issue for $200,000 additional carries. Work will start at once.

The Cedar Point Improvement Company, which is developing a pleasure resort at Cedar Point, near Sandusky, has placed contracts for a power station, including two 400

horse-power De Laval steam turbines and two 500 horse-power Root water tube boilers.

The Craig Shipbuilding Company, Toledo, has secured a contract from the Indiana Transportation Company of Chicago for a large passenger steamer for the service between Chicago and Michigan City. She will be 295 feet long.

The Spellacy-Raiff Company, Coshocton, Ohio, has been formed by M. Spellacy, D. A. Raiff, J. M. Morris, L. A. Smith and others with a capital stock of $25,000. The company will erect a new factory building and will install machinery for the manufacture of enameled ware.

Contingent upon its approval by the State Board of Health, the Board of Public Service of Toledo, Ohio, has placed a contract with the Norwood Engineering Company, Florence, Mass., for the erection of a municipal filtration plant. The company's bid was $483,327. The Toledo plant will have a filtering capacity for 20,000,000 gallons per day.

Government Purchases.

WASHINGTON, D. C., October 17, 1905.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 21, for the followinf supplies for the Mare Island and Puget Sound navy yards: Schedule 177, drum hoisting engine; schedule 179, motors, rip saw table, die sinking machine, surface grinding machine, &c.

The Depot Quartermaster, St. Louis, Mo., will receive bids until November 7, for the following equipment for the various forts: Fort Huachua, A. T., one 30 horse-power boiler; Fort Ringgold, Texas, one 40 horse-power boiler; Fort Wingate, N. M., one 40 horse-power boiler and one compound pump; Fort Logan, Col., one compound pump.

Bids are asked by the Municipal Board, Manila, P. I., until January 12, for the construction of a sewerage system for the city of Manila. The total length of the sewers will approximate 52 miles. Specifications may be seen at the office of the Bureau of Insular Affairs, War Department, Washington.

The following bids were opened October 10 for machinery for the various navy yards:

Bidder 2. Austin Mfg. Company, Chicago, Ill. 4. Alliance Machine Company, Alliance, Ohio. 7. Allis-Chalmers Company, Milwaukee, Wis. 10. Brown & Sharpe Mfg. Company, Providence, R. I. 12. Burke Electric Company, Erie, Pa. 15. Becker-Brainard Milling Machine Company, Hyde Park, Mass. 17. Bigelow & Dowse, Boston, Mass. 20. Baird Machinery Company, Pittsburgh, Pa. 25. Berry & Aikins, Philadelphia, Pa. 27. Crocker-Wheeler Company, Ampere, N. J. 29. J. W. Cregar Agency, Philadelphia, Pa. 30. Central Metal & Supply Company, Baltimore, Md. 34. C. & C. Electric Company, New York. 37. Camden Iron Works, Camden, N. J. 41. Wm. Wirt Clarke & Son, Baltimore, Md. 42. Chicago Pneumatic Tool Company, New York. 47. Detrick & Harvey Machine Company, Baltimore, Md. 49. Drew Machinery Agency, Manchester, N. H. 51. Erie Foundry Company, Erie, Pa. 53. Electric Dynamic Company, Bayonne, N. J. 54. Edward J. Etting, Philadelphia, Pa. 56. Fox Machine Company, Grand Rapids, Mich. 58. Fairbanks Company, New York. 63. Frye, Phipps & Co., Boston, Mass. 67. R. W. Geldart, New York. 68. George Garton Machine Company, Racine, Wis. 69. General Electric Company, Schenectady, N. Y. 70. Hendey Machine Company, Torrington, Conn. 77. Hill, Clarke & Co., Boston, Mass. 78. Handlan-Buck Mfg. Company, St. Louis, Mo. 87. J. B. Kendall, Washington, D. C. 93. Lucas Machine Tool Company, Cleveland, Ohio. 104. Motley, Green & Co., New York. 105. Montgomery & Co., New York. 106. Manhattan Supply Company, New York. 107. Manning, Maxwell & Moore, New York. 117. Niles-Bement-Pond Company, New York. 119. Oliver Machinery Company, Grand Rapids, Mich. 121. Pratt & Whitney Company, Hartford, Conn. 123. Prentiss Tool & Supply Company, New York. 132. Royce & Ricketts, Washington, D. C. 133. H. A. Rogers Company, New York. 134. J. B. Roache, New York. 137. Thomas Somerville & Sons, Washington, D. C. 145. Sherman-Brown-Clements Company, New York. 148. Thresher Electric Company, Dayton, Ohio. 157. Vermilye & Power, New York.

Schedule No. 122.

Class 1. One 70-ton railroad track scale—Bidder 58, $1324; 143, $975.

Class 2. One rock crushing plant—Bidder 2, $1962.50; 7, $2175; 49, $2590 and $2934; 104, $2023.68.

Schedule No. 123.

Class 11. One No. 1 horizontal boring and drilling machine—Bidder 78, $1850; 93, $1640; 107, $1650; 117, $1700 and $1910; 123, $1720; 132, $2150 and $1975.

Schedule No. 124.

Class 21. One triple geared engine lathe—Bidder 29, $1250; 58, $1630 and $1740; 107, $2358; 117, $1800; 132, $1935.

Class 22. One lathe—Bidder 20, $579; 29, $585; 58, $575 and $617; 70, $675; 107, $587 and $670; 117, $598.

Class 23. One emery wheel grinding lathe—Bidder 20, $89; 29, $85; 56, $75; 106, $147.50; 107, $69.

Class 24. One engine lathe—Bidder 20, $940; 29, $1025; 58, $880, $945, $975 and $1060; 70, $1077; 107, $1056 and $935; 117, $1033 and $973.

Class 25. One belt driven wood lathe—Bidder 56, $340; 119, $595.

Class 26. One engraving machine—Bidder 68, $944.50.

Class 27. One milling machine—Bidder 10, $1789.70; 15, $1685; 20, $1571; 58, $1768; 70, $1510; 107, $1584; 117, $1385.

Class 28. One vertical drill press—Bidder 20, $185; 29, $170; 58, $210; 78, $195; 107, $174; 117, $171; 123, $159; 132, $175.

Class 29. One single spindle sensitive drill press—Bidder 20, $65.50; 29, $55; 56, $55; 106, $42.85; 107, $50; 121, $85.50; 132, $55.

Class 30. One belt driven semiautomatic machine for making screw glands for surface condensers—Bidder 121, $682.50.

Class 31. One magnetic metal separator—Bidder 20, $105; 49, $115 and $183; 54, $250, $200, $360 and $300; 107, $125 and $300.

Class 32. One hydraulic shaft straightening machine—Bidder 20, 3395; 29, $3400; 37, $990; 67, $3289; 106, $3674; 107, $3350; 133, $3257.90; 145, $3279.

Class 33. One hydraulic shaft straightening machine—Bidder 20, $210; 29, $205; 37, $520; 67, $198; 106, $240; 107, $200; 133, $192; 145, $238.90.

Class 34. One belt driven band saw—Bidder 56, $182; 119, $351.

Class 35. One hand planer and jointer—Bidder 56, $185; 119, $423.

Class 36. One single frame steam hammer—Bidder 4, $1085; 20, $833; 49, $834.50; 51, $748; 78, $834; 107, $935 and $960; 117, $870; 123, $835; 132, $835; 157, $876.

Class 37. One hydraulic pipe bending machine—Bidder 20, 320; 29, $310; 37, $530; 49, $332; 67, $299; 106, $374; 107, $310; 133, $297; 145, $296.90.

Class 38. One pipe bending machine—Bidder 20, $139; 29, $125; 42, $135; 107, $126.

Class 39. One belt driven drilling and boring machine—Bidder 47, $2109; 107, $1400, $1960, $1510 and $2070; 117, $3250.

Class 40. One boring and turning mill—Bidder 78, $1750; 107, $1450; 117, $1690 and $1390; 123, $1475.

Class 41. One belt driven radial drill—Bidder 20, $1175; 29, $1200; 58, $1340 and $1410; 107, $995, $1030 and $1140; 117, $1025; 123, $1355; 132, $1140.

Class 42. One universal radial drill—Bidder 20, $1565; 77, $1750; 107, $1525; 117, $1550; 123, $1849; 132, $1500.

Schedule No. 138.

Class 93. Two diaphragm bilge pumps—Bidder 25, $190; 30, $30; 67, $31; 105, $30.80; 106, $42; 137, $32.

Schedule No. 143.

Class 101. Forty-eight electrical equipments for delivery at various shipbuilding plants—Bidder 69, $14,760; 148, $13,440.

Class 102. Forty electrical equipments—Bidder 69, $17,040; 148, $14,160.

Schedule No. 147.

Class 121. Four dynamos—Bidder 27, $380; 69, $380.

Schedule No. 148.

Class 142. One Brown & Sharpe special universal milling machine and one special fixture—Bidder 10, $2780; 117, $1760.

Schedule No. 149.

Class 151. Three electric motors—Bidder 12, $809; 34, $938; 53, $800; 69, $792.

Schedule No. 151.

Class 196. Twelve hydraulic jacks, 7 and 10 ton—Bidder 17, $573; 41, $516; 63, $492; 67, $497.88; 87, $497.70; 105, $495; 106, $504; 107, $514.44; 133, $511.68; 134, $432; 145, $515.88.

The following awards have been made for supplies for the various navy yards bids for which were opened September 5:

Hallidie Machinery Company, Seattle, Wash., class 31, two motor drives for two-spindle upright molding machine, $750.

Berline Machine Works, Beloit, Wis., class 32, one motor driven automatic knife grinder, $443; class 34, one motor driven four-roll single surfacer, $860.

Fox Machine Company, Grand Rapids, Mich., class 35, one motor driven hand planer, $425.

Under bids September 30, schedule 273, by the Isthmian Canal Commission, the Austin Mfg. Company, Chicago, Ill., was awarded class 1, well drills and appurtenances, at its bid of $14,456; delivery in 30 days.

Under bids opened on September 26, for the various navy yards, the Crocker-Wheeler Company, Ampere, N. J., was awarded class 11, two ventilating fans, $177.

The Preparation of Molds for Steel Castings.*

BY ARTHUR SIMONSON.

In attempting to bring forward a few points in connection with the preparation of molds for steel castings I realize that almost the best one can hope to do is to generalize on the subject. Every man has to fight his own molding sand battles, because the conditions are as varied as human faces. The shape and weight of the pieces, the casting temperature and, to a great extent, the availability of material play such important parts that it would be impossible to write a standard treatise that would be useful to every founder. If a man in Philadelphia who is making excellent castings should write down in as full detail as possible his method of procedure and the man in New York should take that information and try to do likewise there would be no guarantee of success, the personal equation entering so largely into the making of molds; in other words, the "know how" is what counts, and it is just this "know how" which is difficult to put on paper and transmit from one to another.

Molders Must Be Good Molders.

Given good sand and plenty of muscle, it does not follow that a molder will make good molds. It is necessary to study carefully the pattern he is working on at the time, to adjust the pressure of ramming and the disposition of vents, gates and risers to that particular case. The successful molder is not the one who has the most muscle, but the one having sufficient of that useful commodity and also enough brain to do the above. A man should be proud to be a molder, for it is a trade that calls for the highest degree of skill and intelligence, and in my opinion the molder, as a mechanic, ranks as high as any. That molding calls for high development of skill is evidenced by the regrettably small percentage of good molders that one finds in a day's march.

It has to be admitted that the general average standard of workmanship is much higher in Europe than with us, and this is attributable to the long apprenticeship they serve—generally seven years—before they earn journeymen's wages. Then, again, there is much less of the tramp element than over here. The men stick to one locality and, indeed, to one shop for a great length of time, whereas the molders here are a roving class and no sooner get accustomed to the work in one place than it becomes monotonous and they float away to another. It has been said, aptly enough in some connections, that a rolling stone, while it gathers no moss, yet acquires a very fine polish. I fear this does not apply to molders. The conservative English journeyman, with his seven years' apprenticeship and his tool box containing a wonderful assortment of tools for every conceivable purpose, who stays all his life in the place where he learned his trade, is a treasure to his employer and can scarcely lose a casting.

During the past summer I visited in England the foundry where I took my first steps in the steel business. I had been away six years, but on entering the place it seemed that I had been away no longer than from Saturday to Monday. True, the place was much larger, but out of some hundreds of men whom I knew six years ago there were few absentees. The same men were there on the same floors and in most cases, astonishing as it may seem, assisted by the same helpers, and they were doing the same class of work. There were orders for locomotive wheels and other parts that have been repeated, so that the same patterns were still in the sand. These are the places where the finest castings are made, and it would be strange indeed if it were not so if the old adage about sticking everlastingly at it has any basis in truth.

In giving advice, then, for the making of molds for steel castings I would give it along the lines of that given to the man who asked how to skin a lion—"first catch the lion." In other words, first procure a good molder and the rest will be easy. But in order to get something more concrete let us assume that all our molders are the very best and see what is our part in providing them with suitable material, and then watch them at work. Let us see what are the conditions to be met with in considering the material to be used and the method of procedure in the preparation of the molds.

Very Refractory Molding Materials Required.

In our mind's eye let us picture a typical steel casting, an ordinary machine or engine part. Notice, however, that the skin of the casting is quite smooth, free from pits or scabs, worm like markings or humps. It is a healthy, attractive looking casting of a fine blue-gray color. Its corners are sharp and true and in shape it is like the pattern from which it was made. Strike it with a hammer, it rings true as a bell, showing there are no hidden cracks or hollow places. The mold in which it was made must have been perfect; of what material and how was it made? It had to stand high temperature, great statistical pressure, relentless contraction, and at the same time be smooth enough to give that beautiful skin to the casting. Let us study these points a little closer.

The casting temperature of steel is in the neighborhood of 3000 degrees F. A very few hundred degrees in that high range of temperature make all the difference between hot fluid steel that will run the most complicated castings and sluggish pasty steel that will scarcely run a hammer block. To stand such a temperature the material of the mold must be very refractory. Molding materials are chosen from the acid refractories—that is, their basis is silica. Silica forms the greater part of the earth's crust, and therefore silica materials can be obtained in almost any locality. The difficulty when it arises is to get them sufficiently pure—that is, free from other substances which while probably themselves quite refractory yet in contact with silica form a more fusible mixture. These impurities are chiefly the bases lime and magnesia.

There is little difficulty in obtaining very pure silica sand in America; I have analyzed a great many samples which run over 98 per cent. silica. France and Belgium produce also a very pure flint sand. Of course this pure sand would be entirely useless for molding purposes in its natural condition and it has to be mixed with other things to make it useful, but it must be regarded as the basis of all steel molding sands on account of its infusibility. Sometimes nature provides us with a sand which contains all the necessary ingredients in the natural state, but this is comparatively seldom. In regard to the chemical analysis of steel molding sand it is a fact that this is not much of a guide, for it is the proximate analysis that counts, not the ultimate. In other words, take two sands of exactly the same chemical analysis, and one may be an ideal molding sand and the other useless. It depends on the condition of the elements in the sand.

It is necessary that molding sand should be plastic in order that it may retain the shape imprinted on it by the pattern. This plastic property is given by a certain small percentage of clayey matter or alumina. In one sand the percentage of alumina may be high, but it may be combined with the silica and the sand will not be plastic. In another sand a less proportion of alumina in the free state will make the sand adhesive and consequently fit for molding. In my experience I have always found it better to start with a pure quartz sand and then give to it sufficient body for different purposes by adding varying proportions of a pure clay of known analysis. In this way one has complete control of the strength of the sand and can change it for different purposes to meet the gradations of weight in the castings and whether they are to be made in green sand, skin dried or dry sand. Analyses of three samples of quartz sand obtained from different parts of the United States are as follows:

	One per cent.	Two per cent.	Three per cent.
Silica	96.60	98.61	97.61
Alumina, iron	2.57	0.77	1.41
Lime	0.41	0.25	0.39
Magnesia	0.40	Trace	Trace

A suitable clay of very fine quality analyzes as follows:

	Per cent.		Per cent.
Silica	71.03	Magnesia	Trace
Alumina, iron	22.51	Water and organic matter	6.2
Lime	0.35		

* Read before the Philadelphia Foundry Foremen's Association at its October meeting.

Mixing the Sand and Clay.

Mixing any of the sands and the clay mentioned above in proportions to give from 90 to 95 per cent. of silica and from 3 to 5 per cent. of alumina will give a composition suitable for almost any class of casting. This sand will be much stronger than natural sand as a general rule and decidedly more uniform.

The inking is generally done in a pan grinder with heavy chilled iron rollers. Centrifugal mixers are not so successful, for reasons that will be explained later. The sand and clay in requisite proportions being placed in the grinder, they are moistened with molasses water to such a state that when a quantity is taken in the hand and squeezed a few grains will stick to the hand. It must not cake on the palm or it is too wet. Molasses water is used to give greater body to the sand in the green state and also because it does not evaporate like plain water. The sand is rolled in the grinder for ten to twenty minutes, and if its condition be felt with the hand from time to time it will be noticed that it becomes stronger the longer it is left in. This means that every grain of sand is uniformly coated with clay and explains why centrifugal mixers are not so successful. The heavy rollers thoroughly incorporate the clay with the sand, but they should not be so heavy as to crush the grains.

As to the size of the grains it is wise to use two grades, one quite fine with rounded grains and the other much coarser and with more angular grains. The fine part of the sand insures a smooth face and the coarse part serves to open up the pores and provide a ready means of exit for the gases formed during and after pouring. As regards the strength or toughness of the sand it should be such that on squeezing some of it in the hand the lumps so formed will retain their shape and sustain a slight pressure between finger and thumb before collapsing. This is a more delicate way of testing the strength of molding sand mixtures than appears at first sight. The fingers are very sensitive and sand can be very accurately graded by this means.

The Mechanical Properties of the Mold.

Passing to the second point, which concerns the mechanical properties of the mold itself, we shall try to deal with the question of pressure, contraction, &c. A mold has to stand an enormous pressure, as all know who have seen clamps burst, and holding-down weights and copes lifted by the rising metal. Not only is there the fluid pressure caused by the weight of steel and the head due to the hight of the ladle, but there is the pressure caused by the expansion of the air and the large amount of gases generated while the mold is being poured. Flasks for steel castings therefore need to be heavier and stronger than for iron castings, and all the accessories, such as clamps, plates, &c., also need to be correspondingly stronger. As for the mold—that is, the sand part of it—it must be constructed to stand the strain that is put on it; all projections must be well rodded, the ramming firm and even and the gates and risers cut in such a manner as to relieve the strain as much as possible. It is wise to run castings from the bottom when feasible.

What happens when the mold is poured full? The steel begins to shrink, and if it is a plain shape like a sphere or a cube it will shrink away freely from the mold on all sides. But few castings are so simple. They have projections, bosses, ribs, &c., and consequently when they begin to shrink they meet resistance from the mold. At the instant of setting or becoming solid steel has practically no physical strength; so if the mold is too rigid the result will be that the casting will pull apart. We therefore need a mold to be very strong at the moment of pouring and quite collapsible a few minutes after. If the sand is mixed right this will be the case, as a few minutes at such a high temperature will serve to destroy the binder and the sand becomes "rotten" and powdery.

The fact that steel castings are frequently very much warped or twisted when taken out of the sand shows the resistance that was offered to the free shrinkage of the metal. It is almost impossible to avoid this in some cases, but steps can be taken to reduce it to a minimum. This can be done by ramming cinders, sawdust or shop sand in pockets at the places where the most shrinkage is going to occur. Cracking and warping may be avoided by shaking out the castings while very hot, before the shrinkage has all taken place. This must be done very judiciously, however, or it may result in worse trouble than it was intended to cure.

The smooth face of castings is obtained by coating the molds with a liquid wash consisting of flour silica, a little clay and molasses water. This should produce on the mold when dry a very thin skin, very rigid and with a feel like velvet. It should be possible to rub the powder off to some extent. On this surface the steel will lie quietly without burning in, on account of its specially refractory nature, and it at the same time permits gases to pass freely through it to the more open-grained sand behind.

Referring briefly to the technique of molding, we can make the molds in snap flasks or on the molding machine and the molds would be made in green sand and the procedure identically the same as for cast iron. The sand is used as dry as convenient, and only sufficient clay is used in its composition to make it just stick together when squeezed or rammed.

As regards the ramming, this is probably the most important part of the business. It has to be done more carefully than for iron, and this I say advisedly, for the steel is much hotter and more searching and will detect variations in hardness, with the result of cutting or scabbing. When a mold is dressed it is generally finished with flat headed wire nails, which hold the sand together and cool the face of the casting slightly. The mold must be thoroughly well ventilated, both cope and drag. This is very important.

Core Making.

This section of the steel foundry business is often relegated to a secondary position, though it is truly as important as the molding. The fact that undoubtedly the greatest proportion of defective castings are caused through defects in the core shows that it is a department needing the closest attention. In a core we have generally worse conditions to meet than in the body of the mold, for generally speaking the steel shrinks away from the mold, but it shrinks on the core. On the other hand, a core does not as a rule have to stand the same amount of cutting action as the mold, as the gates should be cut to avoid impinging on a core whenever possible. Cores should therefore be specially refractory and "rotten," but they must be strong enough to handle and to bear the pressure of the rising metal.

In making a core the idea is to produce a strong exterior and a weak interior. This is done by ramming up the core of some collapsible gravel or burnt sand mixed with oil or rosin and then painted with a thick wash of Ceylon plumbago, silica flour and molasses water. Two or more coats may be advantageously given and dried in between. Cores should be almost but not quite burnt. These remarks of course refer to cores of some size. Small cores are not generally coated with wash.

Summing up, it may be said that there is very little difference beween iron molding and steel molding except in details. The difference is chiefly in the different kinds of sand used and the fact that almost all steel molds are thoroughly baked or dried. But there is an increasing tendency to make steel castings in green sand molds, and as sand mixing and composition become better understood this will be still more so. Iron molders make very good steel molders with a little practice and instruction. The conditions are the same, only accentuated. The temperatures are higher and therefore more gases are generated, and we need more open sand and more refractory molds. The higher temperatures also cause higher pressures, calling for stronger molds. There is also a greater cutting action due to the chemical composition of the metal. But the fact that there are being produced to-day in increasing quantities steel castings of magnificent appearance and satisfactory physical qualities shows that the attention that is being given to the molding by our foundrymen is receiving its reward.

Frank S. Witherbee of Witherbee, Sherman & Co., Port Henry, N. Y., has returned from Europe.

The National Machine Tool Builders' Association.

A good sized and enthusiastic gathering of machine tool builders discussed problems affecting their business for two days at the Hoffman House, New York, on Monday and Tuesday of this week. It was the fourth annual convention of the National Machine Tool Builders' Association, and at its close those who attended it said, as they always say at the conclusion of the semiannual meetings of this growing young organization, "the most profitable meeting of the association." There were about 40 members present.

On Monday morning when the machine tool builders commenced to assemble in the lobby of the hotel, a very noticeable feature was the large representation of the prominent machinery merchants in evidence. Heretofore the manufacturing element has had things pretty well to itself at these meetings, but at this convention it was clearly evident that the association has arrived at the point of influence and importance that the "dealers" are now "sitting up" to "take notice" of what is in progress. The dealers are now organized, and to one who has kept track of affairs in the machinery world it was apparent that the merchants on hand at this meeting were the members of the Machinery Committee of the National Supply and Machinery Dealers' Association.

Most things accomplished by both the manufacturers and the dealers at these meetings are kept secret, but it is probably safe to surmise that the question of prices secured some attention. It is well known in the trade that several, if not all, of the machine tool builders believe that prices should be advanced at this time. It is also well known that certain important dealers do not want prices advanced at all at present, but rather are in favor of receiving higher commissions from the manufacturers. So far as can be learned to-day, the upshot of the matter is that the National Machine Tool Builders' Association decided not to recommend a change of prices as an association. The matter is, however, left to the various subcommittees of the association, which include all the members divided into classes according to their products, to be settled between themselves and the dealers.

These committees will hold meetings within a short time to decide whether they really want higher prices or not. The Lathe Committee has already met and decided not to advance prices at present. There are indications that a general advance will be made in milling machines. The fact that within the last few days a prominent builder of milling machines outside of the association has revised its price-lists, advancing an average of at least 5 per cent., will doubtless stimulate the builders of milling machines within the organization to do likewise. The reason given for this advance is that since present prices were made the machines have been improved considerably, especially on certain sizes and types, which now contain a good deal of mechanism for which the consumer is not paying. The prices of such machines, it is held, should be increased to cover the cost of the improvements.

Builders of planers have already taken the matter in hand, and it is safe to say that in a short time all the lists will be revised. This revision will amount to about a 5 per cent. advance. One of the planer builders has placed his revised prices in effect. With the builders of other types of tools, so far as we can learn, the subject is still unsettled.

In connection with the subject of motor drives no conclusion has been reached as yet by the committee now having the matter in hand for the association. More time was requested and the committee was continued. It is the belief of the members individually, however, that some concerted action should soon be taken whereby the machine builder may make as large a profit on a motor driven machine as on a standard belt driven machine. This, it is said, is not the case at present. It is held that in order to build the machine so as to meet the requirements of a purchaser almost all motor driven machines nowadays are really special machines, but are sold so close to the price of standard machines that the profit is eaten away by the special work required. The intention is to bring the prices of electrically driven machines up materially.

The committee appointed to report upon the subject of a new apprenticeship system begged for more time to consider the matter and received it.

The report of the delegates, headed by Secretary P. E. Montanus, who attended the National Reciprocity Conference at Chicago on August 16 and 17, contained the resolution of that conference urging tariff revision, and concluded by saying: "We thoroughly believe that the men in whose hands this matter now is will carefully avoid anything that would tend toward national disaster and incorporate only such modifications as will result in the general good of all concerned."

The election of officers for the ensuing year resulted as follows: President, E. M. Woodward, Woodward & Powell Planer Company, Worcester, Mass.; first vice-president, William Lodge, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio; second vice-president, W. P. Davis, W. P. Davis Machine Tool Company, Rochester, N. Y.; treasurer, F. E. Reed, F. E. Reed Company, Worcester, Mass.; secretary, P. E. Montanus, Springfield Machine Tool Company, Springfield, Ohio. It was decided to hold the next meeting at Atlantic City, N. J.

The Banquet.

On Monday evening a banquet was given at the hotel, which proved a great success as well as a most delightful occasion. Fred. J. Miller delivered an excellent address on the subject of "Government Manufacturing," in which he made a strong plea for greater efficiency in this branch of our national service, recommending the establishment of a Department of Manufactures, the head of which, he suggested, should be a Cabinet officer.

Charles A. Moore of Manning, Maxwell & Moore, Incorporated, made a masterful address on the subject of "Conditions and Possibilities of Trade for American Machine Tools Abroad." So intensely did Mr. Moore interest his hearers that for an hour or more after the conclusion of his address he was besieged with questions asked by the numerous machine tool builders who were anxious to obtain all the information possible on the important points touched in the address.

Mr Moore said in part:

No manufacturer of machine tools that I know of in this country, at present or in the past, has ever been rated what might be termed a rich man, which shows that it is a close business, fraught with many expenses, largely out of proportion to the margin of profit, as compared with other enterprises. But it has its attractions. A man engaged in it feels that he is doing something. He is adding to the material wealth of the country; he is contributing to its development, and I believe that no class of men contributes more to the substantial progress and development of a nation than its manufacturers. You are in the lead, in my judgment, as the designers and manufacturers of tools, both as to their quality and capacity, and as to their attractiveness in design, utility and earning power. But you are weak as merchants and exporters in selling your product in markets other than your own. That, I believe, is largely due to the fact that you have had your attention so thoroughly occupied in building up your business that you have not had the opportunity to go into the foreign countries and study the conditions that exist there, and which it is necessary to know in order to be successful.

One who will give passing attention to this great industry in his visits abroad will discover that our enterprising and aggressive friends, particularly in Germany, are growing comparatively rich selling American machine tools in their own country and the adjoining ones. This I say with all due respect to those active and capable merchants. I take off my hat to them as men who are worthy of all the success they get, and I also recognize their good judgment in being so progressive and observing as to come to the market for the best goods and dispose of them.

Europe Thinks Well of American Tools.

I find in Europe a most kindly feeling toward American tools. In many cases I was taken by people in the countries I visited and shown with pride their great equipment of tools, and was told that they were mostly American tools. Whatever they have of the feeling of national pride which every one has in his own country cannot be counted upon as a serious prejudice against American tools. On the contrary, I believe they are most kindly considered, and the tools themselves, in general, are of such high quality of workmanship and design that they merit all the good feeling that is exhibited by their users.

With that in our favor it seems but a matter of study and intelligent utilization of the information to increase largely our growing business in the industrial fields outside of America. To be sure, we labor under other disadvantages, some of which we can correct readily and others of which will take time. Our carrying trade, as is well known, will take a long time to develop, but should constantly engross the attention of our statesmen and lawmakers.

In the matter of banking I do not think that we give the encouragement and loyal support to American capital in that line that we should. The bankers of Great Britain and Germany have been very enterprising, and have established their branches in the colonies and South American countries, and are of great and material assistance to the manufacturers and merchants of their countries. For the people are very much impressed by the argument that America, with all her prestige, boasted power and industrial progress, is not able to handle the business of her merchants in the banking line. Our drafts have to go through London, and return payments through the same channel. I am no advocate of a commercial war, for I believe it farther reaching and more disastrous, and in many instances more lasting in its results than war at arms. But we have the right to seek trade in every quarter where our goods are acceptable

Preparation of Goods for Export.

And in speaking of those things that we should carefully consider I must make a strong plea to you all to give more careful and intelligent attention to the manner in which you prepare your goods for export. That one item of packing is of vital importance. I have been humiliated many times by seeing goods exported from America unpacked, to find that they were so badly boxed, or crated, as to cause serious injury to them. It shakes the confidence of a buyer, when he has looked forward to the arrival of an important article like a tool, to unpack it and find it injured in a very serious and vital point. He then feels his helplessness, being three to five thousand miles from the manufacturer, with the long intervening time necessary for a letter to reach the manufacturer and, in turn, for the broken part to be replaced and sent back to him, and he suffering the loss of the delay in the interim. These errors can be very readily corrected and that confidence regained by using more intelligance and greater care in preparing these articles for sea shipment. It is not alone injury or defacement by rust and the marring in shipment, but it is the breaking of parts. I remember distinctly at the late Paris Exposition seeing exhibits of American manufacturers, of beautiful finish, incomparable in design, made almost worthless for a long time because of breakage of important parts, while the goods coming from other countries would almost invariably come in perfect condition, with every detail and part cared for in an intelligent and thorough manner.

I would also most earnestly urge upon every manufacturer that he should never, under any circumstances or conditions, however much he may desire an order, send a so-called experimental tool into a foreign market. In the words of David Crockett, "Be sure you're right, and then go ahead." The cheapest way to determine that is in your own establishment, knowing that every part is perfect, that the mechanism is in complete working order, and that the tool will perform every required function without hitch or delay, and then pack it so that it may reach your customer in that condition.

Promises Must Be Kept.

This whole question of trade, whether at home or abroad, is one of good goods, well designed and well made, and the delivery to your customer of the identical article you sell him. You cannot afford to get out attractive photographs, splendid cuts and elaborate descriptions, by which you convey the idea to the possible buyer that the tool is capable of performing almost any known function, and then have it fail in any essential detail. You are not only responsible for the result as it may be to you, but you also owe something to your fellow manufacturer who is endeavoring to get into that same field, for a prejudice created against an article coming from another country also carries with it a little feeling of envy and jealousy that is kindled into an absolute dislike and a loss of the feeling that they are dealing with intelligent, honest, capable manufacturers, which is an injury that it takes a long time to obliterate. You cannot afford, however tricky and dishonest your customer may be, to attempt to meet him on the same grounds.

The National Business Policy.

One of the great questions discussed to-day in all civilized countries is that of the business policies of nations. It is the one burning subject attracting the attention of statesmen, writers, manufacturers and merchants, and it taxes the best thought in the world, to the end that every nation may establish itself in a business policy of the greatest benefit to itself, and yet one which appeals to other nations as one that is fair in the commercial field. The policy of protection is one that has been advocated and demonstrated perhaps to a greater degree by this country than by any other in the world, and while we do not desire to be the envy of all nations, yet by attending to our business and doing business on the lines adopted by our wise and thoughful statesmen, this country has prospered beyond compare. I do not believe any manufacturer or thoughtful American citizen can afford to advocate a change in that policy from a purely and entirely selfish point of view. He must take into consideration the greatest good to the greatest number, and while some enterprising, active machine tool builders may feel that a modification might be made that would give them a little larger business in some particular country, they must carefully consider whether, in advocating that, they do not do a greater injury to other interests, which are of vital importance to them, than they are doing good to their own.

If I were a manufacturer in any other country than America I would be willing to make a very generous contribution of time and money to devise ways and means by which I might obtain the most desirable market on the globe for my wares, which would be America, the country in which they consume per capita from two to five times, in what they eat and wear and the luxuries they enjoy, more than in any other country, where the wages are better and labor more generally employed, and where there is a better return in the products of the soil and from manufacturing. I would make every effort to get in there under the most favorable terms and conditions possible. Why should a concern with a business policy which has proven successful change that policy because competitors desire it to do so? There is no other argument that can be made in honesty by the advocates of any other country to lower our tariff than the plea to give them entrance to this market. In conversation with the representative and thinking men of other countries I have almost invariably, before separating, obtained from them the honest admission that the policy of this country is one that is most admirable and beneficial to us.

The American Position.

We know there are many inequalities and in the present condition some changes that should be considered, but it is opening up a very dangerous question which cannot be taken up quickly and disposed of as a matter of sentiment, but has got to be laid out by careful, prudent men, who have given careful study to the subject and who are practical. We have demonstrated to the world that the trade policy under which we are working for the past few years has been of great practical benefit to the citizens of America, and, in turn, to those of the world. We have not tried to make others poorer, we have not tried to reduce the wage earner's compensation, we have not tried by our policy to make our own citizens less prosperous, nor have we tried to make ourselves the most prosperous by taking from others that which belongs to them. We have conducted an honorable, straightforward policy, announced broadly and plainly to the world, and the world has received much the benefit of our success. Holding up Great Britain's free trade policy compared with the American policy of high protection, which is made to appear to many as a menace and as serving notice on other countries to keep out, does not correctly state the case. We realize that when we consider this fair statement of the situation in free trade Great Britain, boiled down: There they levy a per capita tariff of $4.30 on the noncompetitive articles, while in this high protective country our per capita tariff is $3.50 on competitive articles.

If the advocates of tariff revision, reciprocity, or any other change or form of tariff law will name twenty articles out of the great schedule of the Dingley tariff, from a reduction of the duty upon which a greater benefit than injury will result to the greatest number of citizens, I am ready to join them in advocating that change.

Some Th ngs Needed.

We must be ever alert, studying the wants of those we desire to supply with our goods, and studying them intelligently and conscientiously, and adapting our goods to the wants and requirements of our customers, and keep up a constant watchfulness that we do not become weak in our overconfidence. The price of business and reputation is eternal vigilance. When a man gets tired of playing the game let him retire, and never spoil it by indifference and lack of interest in it. I believe that with the prestige which you manufacturers of machine tools now possess, justly established through the merits of your designs and the character of your workmanship, you will now reap the harvest of the great expenditure of time and thought which you have devoted to the development of this splendid industry. And you must do so, not alone in your individual capacity, with the one selfish thought of getting there yourselves, but must aid, by advice and conferences with your fellow manufacturers, in keeping up that splendid well-earned prestige. You cannot do it alone by making pictures and descriptive matter of your various products, but you must follow them, yes, lead them, by energetic, conscientious young men, who shall go forth equipped with the necessary practical information, address and knowledge of their business, and press your wares on the attention of the world, and the world's markets will be yours. They cannot stay your progress, they cannot defeat you in our honest purpose. It takes patience and courage.

HARDWARE

A GREAT many merchants, large and small, and a few manufacturers interested in the line directly affected have been perplexed by apparent irregularities in the Horseshoe market, which in general is free from such disturbances, as the ruling prices are well maintained and the whole situation is well in hand by the manufacturers. In the midst of this comfortable regularity and with a large volume of current business certain very low quotations were made broadcast and in a decidedly aggressive manner by a well-known catalogue house. The prices named by this house were considerably below the market and the wonder was where it got the goods. Conjecture was even ventured that as a flier it was deliberately selling the Horseshoes at a loss, hoping to make it up by the increased sale of profit bearing articles, as is the way not infrequently with all classes of merchants when occasion demands the use of leaders. The mystery, however, was not long in clearing up. The facts in regard to the matter, given in another column, are exceedingly interesting and suggestive.

It appears that the Horseshoes in question were made by a company owned and operated by prominent Hardware jobbing houses, and for reasons into which it is not necessary to go were sold at special prices to a well-known retail catalogue house, which offered them to the public at a decided cut in price, lower indeed than retail merchants or even jobbing houses could buy the goods from the associated manufacturers. Although the goods in question were put on the market with a flourish of trumpets as to their quality and the great bargain offered, they do not seem to have given entire satisfaction, and it is understood that many of them went back from the critical blacksmiths to the Chicago retail mail order house that sent them out. This is certainly a curious and complicated transaction, which suggests some interesting reflections:

I. In the arrangements which underlie this episode there is an interesting illustration of the tendency on the part of jobbers to become manufacturers, as in this case a group of jobbing houses in different cities united in the ownership and operation of a Horseshoe plant for the production of goods for their own sale. This was doubtless done in the hope that they would be to some extent independent of the regular manufacturers and be able to secure something of the manufacturers' together with the jobbers' profit. Those disposed to moralize will make the point that there are perils attending manufacturing enterprises which the jobbing trade should hesitate recklessly to encounter, especially as when difficulty or disaster comes the trade at large will suffer. Manufacturing is not always a bonanza, and skill and experience are needed to make it a success.

II. There is something almost pathetic in the fact that while Hardware jobbers in their resolutions deprecate the sale of goods to catalogue houses and denounce those who sell them, there is in this instance, unless the circumstances are strangely misunderstood, an illustration of the fact that catalogue houses find little difficulty in obtaining goods from jobbing sources. The occurrence should indeed tend to rebuke the disposition on the part of some merchants, wholesale and retail, to cast upon the manufacturers all the odium of supplying the catalogue houses—a matter in which, if it be blameworthy, neither jobbers nor manufacturers as a class can consistently throw the responsibility and reproach upon the other. Too much will probably be made of the incident in question to emphasize the alleged half-heartedness and insincerity of the jobbing trade in the catalogue house agitation. It may, however, quite reasonably be used by manufacturers to parry the recriminations of merchants who would impress upon them the obligation to decline business with the retail mail order houses, whom the jobbing trade are in many instances besides the one under consideration ready to sell.

III. The extravagant and misleading description of the Horseshoes in question which was given by the catalogue house is suggestive. Without reflecting unduly on the character of the goods produced in the jobbers' mill, it is a grotesque exaggeration to say that this make of goods is sold by nearly all the jobbers of the country and used by nearly every horseshoer in America. The description of quality is equally extravagant. If catalogue houses are to resort to such misrepresentations they will do much to discredit themselves with the public. This method of overstatement on their part is, however, only too frequent. While this kind of thing reflects on commercial methods generally, it is fortunately a practice which overreaches itself and in the long run reacts upon those who resort to it. Not a few blacksmiths throughout the West will hold in lower esteem the house that, even though it were unintentional, made such unfounded claims for goods of at least questionable quality.

IV. It is significant that the Horseshoes, the sale of which stirred up such a rumpus, bore a private brand. The name looks very well on the head of the keg, but gives not the slightest guarantee of quality. The manufacturers did not care to be identified with the goods or be held responsible for them, and the shoes went out into the market with a name that did not signify anything. This transaction certainly emphasizes the suspicion with which special brands are to be regarded.

Condition of Trade.

Among Hardwaremen and those in related lines substantial unanimity prevails regarding the existing favorable condition of trade, whether from the standpoint of manufacturer or distributer, great or small. Orders for fall at this late day are seldom large in quantity, but requisitions now received are frequent, are of fairly good volume and as a rule are for actual needs. Manufacturing representatives at distributing centers find it imperative to keep urging their principals in the matter of shipments, the situation being aggravated in some quarters by past backwardness of buyers in ordering. There is also complaint as to the difficulty of accumulating even moderate stocks with which to care for current nearby business where purchasers are importunate. Some manufacturers find their bookings for next season's trade no larger than for the corresponding period of a year ago, but refer to such orders as satisfactory even if conservative. Allusion is also made to the favorable October weather for harvesting the later crops, especially Western corn, which high winds in September blew down in some sections, but which even under these conditions has ripened and been gathered without much loss. The export trade is

reported better, especially to Continental Europe. Domestic business in Great Britain, although not yielding large profits, is appreciably better. Collections are variously alluded to as never better, moderate and slow, differing somewhat according to the trade involved. Such changes as there are in prices are in the direction of advances, several such varying approximately from 2½ to 5 per cent.

Chicago.

The general prosperity of the Western Hardware trade continues unabated, and the demand for seasonable goods, notwithstanding the heavy buying during the past two months, shows no apparent diminution. Jobbers in Wagon and Implement Hardware, wood stock and accessories report an abnormal movement, as Western manufacturers of wagons and carriages are preparing for the biggest year in the history of the trade, and Implement makers, on account of the unparalleled prosperity of the West are also preparing for a big buying movement next season. This year's tremendous crop, with its attendant prosperity, puts aside all fears of overproduction among these manufacturers. The shortage of desirable wood stock on account of the wet season in Arkansas has compelled wagon and Implement manufacturers to buy in the open market and jobbers are unable to cope with the demand. Prices have in consequence been advanced and Wagon Hardware generally is firm and higher in price. The advent of motor vehicles has not affected demand for wagons and carriages, and the International Harvester Company, which last year became a manufacturer of wagons, is preparing to double its output. On account of the recent advances in Bar Iron all lines made from this material, such as Bolts, Screws, Nuts, &c., are higher in price. Forthcoming advances in Chain which have been generally predicted have not yet materialized, and in almost all lines of the Hardware trade manufacturers are acting conservatively with respect to advancing prices, notwithstanding the strength of the general Iron and Steel situation and the higher prices which they are compelled to pay for their raw material. Local jobbers are experiencing considerable difficulty in keeping up stocks, especially of seasonable goods, and shipments from manufacturers of almost all lines are growing more uncertain, and the shortage of cars, together with inadequate railroad yard and transfer facilities, is adding further difficulties to the situation. There is practically no change in Builders' Hardware, manufacturers continuing behind on deliveries, and prices rule relatively low.

Philadelphia

SUPPLEE HARDWARE COMPANY.—One would naturally infer that the continued warm summer weather would tend to reduce or at least retard trade, from the fact that October weather conditions are usually of such a character as to stimulate trade for winter goods, but on the contrary trade has continued active with the lines of goods sold during the last days of August and during the month of September. Building Hardware has been in active demand for finishing up buildings and building operations commenced during the summer months, and carpenters' and mechanical Tools have also continued in active demand.

In our last letter to *The Iron Age* we ventured the opinion that the trade of September would equal that of August, and it shows we were correct in our opinion, and with the jobbing trade it has been equal if it did not surpass August. The large crops throughout the country have had a wonderful effect in stimulating trade and manufacturers of all kinds are very, very busy, consequently men who have a mechanical knowledge of the work required have no difficulty in finding employment and there is a shortage of workmen with many of the manufacturers. We are informed by a manufacturer in our city that it is difficult to obtain workmen. As a rule wages are high and manufacturers are all sending out a wonderful amount of product. From present appearances it looks as if more pig iron would be manufactured this month than during any month of the year. The manufacturers of steel are behind their orders and there is a great demand for their product for manufacturing Tools.

The freight departments of the railroads are doing business to their utmost capacity, and notwithstanding the many thousands of new cars placed on the roads the last two or three years there is a great shortage of cars to supply the demands of the mercantile trade, but more especially the demand for the moving of agricultural products. This shows not only that trade is satisfactory but that the outlook for trade for the fall months is exceedingly gratifying. The retail trade of our city, which supplies the demand for a general line of goods, has been exceedingly active and reports that it never had a better September in its existence and considers the prospects for October equally good.

Without any desire to cast aside prudence, without any desire to be over optimistic, we think the prosperity of our country has never surpassed its present conditions.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Business continues in satisfactory volume. The recent cool spell has stimulated the sale of seasonable goods in all lines and will give an added impetus to business. The quarantine is being relaxed in the yellow fever districts and salesmen in those sections are again traveling. In a short time this business, which has been tied up, will add to the general volume.

We now hear of car shortages, of manufacturers being behind in filling orders and the other usual manifestations of a pressing demand. At a time when the market is stiffening on all lines a drop in the price of Hatchets excites some surprise and wonder.

The low prices prevailing on Enameled Ware have largely increased the sales of this class of goods. It is interesting to note the sale of Enameled Goods is increasing at the expense of Tinware. As Enameled Ware will last so much longer in active use than Tinware it is evident the consuming public has discovered it is economy to buy the former.

In the past two weeks an unusual number of new stock orders have been placed in this city, principally by merchants from the Southwest. That section is rapidly increasing in population, new towns are being located, the older towns are growing fast. The demand for Hardware is naturally large. This city enjoys not only the advantage of being the gateway and the natural source of supply of the Southwest, but having catered to that trade for so many years the stocks of goods in St. Louis in all lines are particularly suited to the requirements of this new and developing country.

Recently in conversation with some of these merchants who were purchasing new stocks the writer was interested in the fact that several of them realized the importance in embarking in a new business of buying their goods from salesmen thoroughly posted in regard to the kind and character of goods they would need. It is a refreshing sign of increasing intelligence when merchants, while careful, are not unduly solicitious about the matter of price, but realize the very great importance of selecting an assortment of goods that is suitable to the peculiarities of the locality in which they will do business, and are also careful to purchase these goods in quantities in proportion to their natural sale. The writer believes, as a result of many years observation and experience, that many merchants are seriously injured right in the beginning of their enterprise by falling into the hands of careless, indifferent or ignorant salesmen who fill them up not only with wrong kinds of goods, but also with the wrong quantities of the right kinds of goods.

It is of far more importance for a merchant just embarking in business to devote his main attention to the character of goods and the assortment of his first order than to attempt to "split hairs" on prices. Even an ignorant salesman, guided by his catalogue, cannot go very far astray on prices, but when it comes to selecting an assortment of goods the ignorant or careless salesman has full swing, there is no guide, and many are the merchants who have not realized until they have been in business some time how their interests have suffered at the hands of such salesmen.

There is what we believe to be an objectionable cus-

tom on the part of several jobbers of paying their salesmen extra commissions for the sale of certain classes of goods. It is only human nature for the salesmen to try to swell their incomes by the sales of such lines. When the confiding merchant places himself in the hands of one of these salesmen you can always count upon his having at least a "sufficient quantity" of these commission goods. Merchants buying from these houses are almost invariably overstocked on some of their "fad" lines. Given the names of certain houses we can almost tell on what lines of goods their customers will be, to say the least, very well stocked.

We therefore believe it is wise for merchants in purchasing new stocks of goods, while giving the matter of price a fair share of their attention, to avoid getting what we may term "freak assortments," representing simply the "fad" ideas of certain houses or the commission accounts of certain salesmen.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Market conditions are still favorable to the seller. The steel and iron mills are extremely busy, and there is no complaint of contracts not being fully specified and taken out within the time agreed. A steady, persistent demand for actual consumption in factories and machine shops and for building operations prevents anything like weakness in price; in fact, for some supplies a premium is cheerfully paid for prompt delivery.

The very early cold snap has been most opportune this year, the frost of the 11th reaching, as it did, down into the confines of Louisiana and southern Mississippi. It gives an excuse to raise at once the troublesome quarantine restrictions, which have interfered with traveling and traffic all over the section south of us for the last two months. We will expect to see an immediate response in the way of a large volume of business, for the great staples are in abundant supply at the interior shipping points, and traders are only waiting for free intercourse to be established in order to convert these into cash, starting money and commodities in great volume through their accustomed channels.

The State Development Convention, which has just closed its three days' session here in Louisville, was the most successful of any State meetings ever held before. It dwelt on such questions as "Forestry," "Taxation," "River Improvements," "Crop Cultivation," "Fertilizing," &c., and manifested a more intelligent interest in all of these great questions than has ever been shown before. Following, as it did, hard upon the race season and horse show week, it was remarkable in that the nights of the usual conventional orator exploiting Kentucky's best products were happily missed. There was more talk of alfalfa than of bourbon, and more of coal and timber than of horse flesh, and nothing at all said about the "beautiful women," for all of which the convention, the State and the country at large is to be profoundly congratulated.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—This week will bring to a successful and brilliant close the Lewis and Clark Centennial Exposition and Oriental Fair, an exposition that will go down in history as unique in its conception and outcome. Located as Portland is in the center of one of God's most fertile countries, endowed with a wealth of scenery, both of rivers, lakes and snow-clad mountains, the setting was perfect so far as natural advantages were concerned.

The question to be considered was as to whether the scantily populated States of Oregon, Washington, Idaho and Montana would support an undertaking conceived on the scale of this exposition. The outpouring of the loyal people of the Pacific Northwest, supplemented by the open handed, generous residents of California and the 100,000 tourists from east of the Missouri River, has developed an attendance of 2,500,000, making the exposition a success from every point of view.

Many eyes will be dim next Saturday at midnight as they ascend the grand staircase from Guild's Lake to the Esplanade, where are situated the exhibit buildings, to think that they are looking for the last time on a scene that can only be duplicated in fairyland. The beautiful grounds, flowers, buildings and electrical effects will at once be turned over to the wreckers for what little salvage remains for all the time, energy and money expended on a temporary exposition of local and world-wide products and resources. That the good effects will be manifest for years to come on the Pacific slope in renewed interest and development there can be no question.

Fall trade is now on in full swing. There are no complaints and as producers are holding rather than selling, trade should be better rather than less as the season progresses.

Cleveland.

THE W. BINGHAM COMPANY.—All Cleveland jobbers are having a splendid trade at this time. Large quantities of goods are going forward by water to the West and Northwest before navigation closes. This refers particularly to Nails, Wire, Merchant Pipe, Cast, Malleable and Brass Fittings, and other heavy goods, as well as a general assortment of Hardware. Throughout the interior trade is also very good. Were it not for the shortage of cars at the present time, affecting all railroads throughout the country, we could serve our customers much more promptly. However, we are not the only sufferers in this car shortage, as we understand that this condition obtains at all large points, and is especially noticeable where there are large quantities of grain, coal and ore to be moved.

Trade at the present time does not seem to be confined to any one line, but orders are well assorted for a general variety such as Mechanics' Tools, and, especially at this time, house trimmings and goods for fall and winter use. There will be a large trade in Grain Scoops, Baskets, Corn Shellers and Huskers. The first or early orders for fall goods were shipped a month ago. Cold, threatening weather has induced many duplicate orders on Stove Boards, Coal Hods, Elbows, &c.

Some customers are desirous of placing their orders for Wire Cloth and Poultry Netting for shipment next spring, but no prices have been made as yet, nor do we expect any will be made until sometime in November. We expect a steady trade throughout the remainder of the year. Trade on Holiday Goods, Carvers, Fancy Cutlery and knickknacks has begun. The duck hunting season is on and quantities of Sporting Goods, Guns, Ammunition, Hunters' Clothing, &c., are finding a ready sale.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—There has been a very marked improvement in the condition of the Hardware business in the past 30 days. The fall trade is now on in dead earnest; in fact, we have never seen business better at this season of the year than it is today.

The quarantine regulations in some of the Southern States, particularly Louisiana, Mississippi, southern Alabama and extreme western Tennessee, have interfered with business for several months, but this week the whole Southern country has been blessed with a light frost, and the fear of yellow fever in sections where it has not appeared will not interfere with business, and, while the quarantine will perhaps not be raised until November 1, the regulations will not be so strictly enforced as they have been heretofore. We have had with us in Nashville great numbers of people from the Southern country who fled from the yellow fever, but who are now returning to take up the every day duties of business life.

The commercial world is already beginnning to feel the effect of the resumption of business in the quarantine districts and, as the yellow fever has been in a very mild form and has been restricted to a few localities, the business world will soon forget that it existed at all. Every one is enjoying a fine trade and expecting continued prosperity, there is a general scarcity of croakers, prices of Hardware are firm and advancing, money is plentiful and we are all happy.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The general business situation remains fully as favorable as it was at the time of our last review. All kinds of seasonable merchandise are going into consumption rapidly. Orders from the country cover well assorted lines of goods, showing that retailers are enjoying a steady and continuous demand. In practically every part of this section of the country numerous evidences are apparent everywhere in the shape of new buildings, both for commercial and residential purposes.

The demand for Builders' Hardware and building material is something large. Manufacturers of these goods find it difficult to satisfy the demand with their usual promptitude, consequently temporary delays in the delivery of material cannot be avoided, and this phase of the situation will probably continue until the rush is over.

A very confident feeling pervades all commercial classes and to this the great crops directly contribute. Summed up the business situation is very satisfactory in all respects.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—October business has been fairly well sustained, although not quite up to expectations in some respects. The weather has generally been very favorable for farm work and farmers have been so much engaged in threshing, plowing, &c., as to have very little time for improvements in volume. Threshing is now quite well along and cool weather prevails and there will be more active demand for goods in many lines. Some lines have continued very active throughout the entire fall. There is a large scarcity of cars on some of the railroads and it is with great difficulty that the grain is being handled in some of the newer sections of country. This trouble will probably be largely overcome in the next few weeks, especially if winter holds off, as was the case last year.

Collections are fairly good, but not up to what they would be if grain were moving as rapidly as desired.

NOTES ON PRICES.

Wire Nails.—The scarcity of Steel and prospect of greater shortage in cars when cold weather sets in have stimulated the placing of orders to a large extent. Mills are full of orders and are being operated to their capacity. The market is in good condition, reports indicating that official prices are being maintained, and a further advance would not come as a surprise to the trade in general. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carload lots to retail merchants	1.85

New York.—Jobbers continue to have a large demand for small lots from store. This is so persistent that assortments are frequently broken before it is possible to replenish stocks. Not infrequently jobbers are a day or two behind in filling orders. Some jobbers are still selling Nails, that were contracted for before the recent advances, below schedule prices, and to this extent the market is irregular. Regular quotations for small lots from store are, however, $2 to $2.05, base.

Chicago.—Large orders have been received during the week from the fever-stricken Southern States, where trade has been at a standstill for nearly four months. Reports received from this section of the country indicate that the fever is dying out and that business generally is resuming its normal condition. The tonnage booked by the mills thus far this month exceeds that taken during the same period in September, and the indications are that the present month will show a bigger tonnage than either of the two preceding. Prices are being firmly maintained, and there is no necessity of the mills cutting, as the volume of business offered is more than they can handle. Official quotations are as follows: $1.95 in car lots to jobbers and $2 in car lots to retailers, with 5 cents higher for less than car lots from mill.

Pittsburgh.—We note great activity in the Wire Nail trade and the mills are running to their capacity. The large jobbing trade is pretty well covered by contracts on which specifications are coming in very freely, and there is also a good current demand. As soon as winter weather starts there will no doubt be great delay in shipments owing to shortage in cars and scarcity of Steel, and for this reason buyers are anticipating their wants as far ahead as possible. The market is firm and we are advised that official prices are being rigidly held. We quote Wire Nails at $1.80 in carloads to the largest jobbing trade and $1.85 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

Cut Nails.—No date has been fixed for the next meeting of the Cut Nail Association. Conditions in the raw material market justify an advance in price of Nails, although in the Western market large orders from jobbers are sometimes taken by mills at less than the regular quotations. The demand is good in anticipation of higher prices. Quotations are as follows: $1.65, base, for carload lots, f.o.b. Pittsburgh. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities are held at $1.75, base, in carload lots.

New York.—A moderate demand exists for small lots from store. Some irregularity exists in prices, but regular quotations for small lots from store are on the basis of $1.90.

Chicago.—On large lots to jobbers Cut Nail quotations are being shaded from 2½ to 5 cents a keg. The tonnage booked recently, however, has materially increased, and the inability of the Wire Nail producers to make prompt deliveries is also diverting some business to the Cut Nail mills. We quote Steel Cut Nails in car lots to jobbers, $1.75 to $1.80; car lots to retailers, $1.85; and less than car lots, $1.90; small lots from store, $2, base. Iron Cut Nails are firm at $1.85 in carload lots.

Pittsburgh.—Buyers are anticipating an early advance in price of Cut Nails, and are placing orders liberally and as far ahead as possible. Prices as a rule are firm, and with the scarcity and high prices of Steel Billets it is generally believed there will be an advance in Cut Nails before long. We quote Cut Nails $1.65, base, in carload lots, f.o.b. Pittsburgh, an advance of 10 cents per keg being charged for Iron Cut Nails.

Barb Wire.—Mills are receiving specifications on contracts, also new business, in considerable volume. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago.—The unparalleled prosperity of the farmer in the West and Northwest alone accounts for the present heavy unseasonable demand, which is greater than the mills have ever before experienced. Quotations are being well maintained as follows: To jobbers, Chicago, car lots, Painted, $2.10; Galvanized, $2.40; to retailers, car lots, $2.15; Galvanized, $2.45; retailers, less than car lots, Painted, $2.25; Galvanized, $2.55; Staples, Bright, in car lots to jobbers, $2.05; Galvanized, $2.35; car lots to retailers 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—While this is the off season in Barb Wire, consumers are specifying liberally on contracts placed some time ago, and the mills are entering orders for a moderate amount of new tonnage. Jobbers report a fairly large movement from stock and prices are firm. We quote Painted Barb Wire at $1.95 and Galvanized at $2.25 in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Smooth Fence Wire.—New business and specifications on contracts are being received by the mills in large volume. The market is steady and prices are maintained. Quotations are as follows, f.o.b Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed.....	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized....	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Mills are unable to cope with the specifications that are now being received on the heavy contracts recently placed. Consumers are insistent, and, despite the operations of the mills at their capacity, deliveries are gradually falling behind. There is no material diminution in the volume of new business that is being placed and no difficulty is experienced in holding prices recently announced. Quotations are as follows: $1.80 to jobbers, f.o.b. Chicago, in car lots, and to retailers, car lots, $1.85.

Pittsburgh.—Most of the large trade is pretty well covered by contracts, but a good deal of new business is being placed and the mills are very busy. Buyers are anticipating their wants to some extent on account of the shortage in cars, which will interfere considerably with shipments just as soon as the weather breaks. We are advised that the market is firm at the official prices, which are being rigidly held. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The above prices are for base numbers, 6 to 9.

Shovels and Spades.—Prices on Shovels and Spades still remain on the low level that has been established, although a very fair volume of business is reported, with especially good orders from the jobbing trade. Some buyers seem to be anticipating their requirements, a procedure which has been unusual in this line for many months. Market conditions have long been unsatisfactory to the manufacturers, and fourth-grade goods, on which competition has centered, have ruled very close to cost. A readjustment has taken place, however, in which the weaker concerns have been forced to discontinue production or turn their attention to other lines. As a result the situation shows signs of improvement, and in view of the advances in Steel and Handles it is not improbable that sooner or later manufacturers will be able to make contracts at more remunerative prices.

Oakum.—The demand has been fairly good so far this month, but not equal to the same period last year. A still further falling off in requirements is expected to follow the closing of canal navigation in the West, which will take place on October 31. Prices of different manufacturers vary slightly as indicated by the range given in the following quotations, which are f.o.b. New York in small quantities:

	Cents per pound.
Best	6¼ to 6½
U. S. Navy	5¾ to 6
Navy	4½ to 5

Rope.—A fair to active demand is being experienced by manufacturers. Sisal Hemp has advanced ¼ cent per pound, while Manila Hemp shows no change in price. Some manufacturers put so small a proportion of either kinds of Hemp into mixed Rope that changes in raw material do not immediately affect prices of the finished article. Some manufacturers have advanced the price of Jute products ¼ cent per pound. General quotations are as follows: Pure Manila, 11¾ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 cents per pound.

Window Glass.—The only change which has taken place in the situation affecting manufacturers is that those who favor the sliding scale of wages and who have started their factories or contemplate doing so soon are introducing apprentices in their plants to make up in part for the deficiency in skilled workmen. A conference held last week between representatives of the National Association of Window Glass Manufacturers and of the union advocating the flat scale was barren of results as far as coming to any satisfactory agreement concerning wages. The number of factories being operated is gradually increasing under both scales of wages. Merchants appear to be buying only to satisfy immediate requirements, owing to the unsettled market conditions. New York quotations are as follows: First two brackets, single and double strength B, 90 and 10 per cent. discount; all other sizes, single and double strength, 90 per cent. discount.

Linseed Oil.—Spot Oil is in good demand in this market, as it has been for some weeks. Futures up to January 1, 1906, are offered by crushers on the basis of 35 cents for raw. New York quotations for prompt delivery are as follows: City Raw, 45 to 46 cents per gallon; State and Western Raw, 43 to 44 cents per gallon, according to quantity.

Spirits Turpentine.—It is interesting to note that since July 4 prices of Spirits Turpentine have advanced about 12 cents per gallon, although it has not reached the highest figure in June of this year. Existing conditions, including higher wages paid laborers in the Turpentine belt, higher freight rates, scarcity of transportation facilities and the combines, are some of the causes held responsible for the high values reached. Wood Spirits and substitutes for pure pine Spirits have come into more general use in consequence. In the local market demand has been comparatively light for pine Spirits, owing to high prices. New York quotations are as follows, according to quantity: Oil barrels, 71 to 71½ cents; machine made barrels, 71½ to 72 cents.

THE WASHINGTON CONVENTIONS.

THE annual conventions of the National Hardware Association and the American Hardware Manufacturers' Association will be held, as already announced, on November 8, 9 and 10 at Washington, D. C. The Executive Committee of the National Hardware Association will meet on the 6th and 7th, the association holding its first session at the Arlington on the 8th at 10 a. m. This will be an open session, at which the manufacturers and other visitors will be present. After the president's address and the report of the secretary-treasurer the subject of catalogue house competition will be taken up. An executive session of the association will be held in the afternoon.

In the evening a progressive euchre party will be held at the Arlington, the affair being in charge of a committee of ladies. Prizes will be awarded in practically the same manner as at the card party at Atlantic City last year. There will be no charge for participation in this event. Manufacturers who desire as an advertisement to contribute some article of their own manufacture are invited to send it to Mrs. F. P. May, Arlington Hotel, Washington, in time to be received by the committee by Monday, November 6. It is desired that those who propose to send prizes shall communicate with Mrs. May at once, stating what prizes will be sent. The ladies, however, want it distinctly understood that they do not solicit these prizes as a contribution, so that manufacturers need not feel that there is any obligation to send anything unless they heartily desire to do so.

On Thursday morning the association will hold an executive session. At 12.30 President Roosevelt will receive all the delegates and visitors at the White House. This reception will be by card only, which may be obtained from F. D. Mitchell, secretary of the American Hardware Manufacturers' Association, 309 Broadway, New York, or T. James Fernley, secretary of the National Hardware Association, 505 Commerce street, Philadelphia.

On Friday executive sessions will be held morning and afternoon, and in the evening the annual banquet will be given under the auspices of the National Hardware Association.

Delegates and visitors will be furnished with a badge bearing their name and the name of the house with which they are connected. To accomplish this it will be necessary for the members and visitors to communicate at once with the secretary of the American Hardware Manufacturers' Association or the secretary of the National Hardware Association.

Frank Howard of Howard & Brown, Ludlow, Vt., has sold his interest in the firm to Henry T. Brown, who will continue the business.

RURAL DELIVERY P. O. ORDER.

FROM OUR WASHINGTON CORRESPONDENT.

WASHINGTON, D. C., October 17, 1905.

"I THINK you are safe in predicting that as the result of the investigation which has been made by the Department the regulation permitting mail to be delivered on rural routes by box number only and authorizing postmasters to furnish applicants with the number of routes and boxes thereon radiating from their respective offices will be withdrawn, leaving in force only that part of the original order providing that boxes on rural routes shall be serially numbered. No formal decision has yet been reached, as the Postmaster-General has not been able to reach a final conclusion because of the pressure of other business, and until he has acted no more positive statement can be made."

Fourth Assistant Postmaster-General De Graw to-day made the interesting declaration quoted above in an interview with the correspondent of *The Iron Age*. The statement is believed to

Foreshadow the Final Action of the Department

on this important question, and it would not be surprising if no further announcement should be made for some time owing to the peculiar status of the matter. The original order having been suspended as to all its features except that requiring letter boxes on rural routes to be numbered, it is apparent that no further action is necessary to remedy the situation complained of in the protests against the original De Graw order. Up to the present time the objectionable features of the order have not been put into force at any post office so that no harm has been done. It will therefore be entirely satisfactory to retail merchandising interests to permit the matter to remain in its present status indefinitely. Because of these facts it is quite possible that no further formal action will be taken by the Department. If, as now seems probable, the Postmaster-General decides that the objectionable features of the original order shall not be put into force it will not be necessary to make any formal announcement of these conclusions as the order of suspension will then be equivalent to a complete revocation. Of course, merchants should not be too sanguine, and until the final decision of the Department is reached, notice of which will be given in this correspondence, retail merchants who have not acquainted the Department with their views should do so at the earliest practicable date.

An Official Memorandum.

The Post Office Department to-day made public the first statement of a formal character that has been made since this issue arose. It is in the form of a typewritten memorandum issued for the use of the daily press and is designed to inform the public as to the origin of this controversy and the position of the Department at the present time. It is as follows:

The suggestion to extend to rural mail boxes the provision of the postal laws and regulations which permits delivery of mail matter to city boxes by number only has recently furnished a live subject for correspondence in the Post Office Department. The original suggestion carried with it a statement, which appeared to be justified by the records, that the proposed extension would greatly increase the receipts at rural free delivery post offices.

Inquiry on the subject at the office of the Fourth Assistant Postmaster-General to-day developed the fact that it had been found exceedingly difficult in many sections of the country to make prompt deliveries of letters on rural routes where there are a number of families of the same name. In order to overcome the difficulty and enable postmasters to furnish carriers and substitutes with proper and complete rosters of patrons on their routes the conclusion was reached after careful and thorough consideration that the best way to accomplish the end desired would be to number the boxes and have rosters prepared showing opposite the number of each box the names of all persons entitled to receive mail at that box. For instance, if there were a dozen Smiths receiving mail at box No. 1 on rural route No. 1 a list of the names would be placed opposite rural box No. 1, so that the carrier or his substitute could see at a glance where each person's mail should be deposited.

After it had been decided to number rural boxes, the suggestion was made that it might be feasible to extend to the holders of rural boxes the privileges given holders of city boxes, as embodied in paragraph 7, section 638, Postal Laws and Regulations, which is as follows: "Mail addressed merely to the number of a box may be delivered to the holder thereof so long as no improper or unlawful business is conducted in this manner."

In order, however, to test the feasibility of the proposed extension the Department made public the proposition with a view to bringing out any objections to it that might exist. The publication appeared in July last, and nothing having been heard against it, the order was accordingly issued. Very soon thereafter a number of protests were received, in view of which the execution of that part of the order extending the provisions of section 638, Postal Laws and Regulations, to holders of rural boxes, was deferred indefinitely, pending the result of an official investigation which is now in progress. When this investigation is complete final action in the matter will be taken by the Department.

A Word of Explanation.

One statement in the closing paragraph above quoted requires a word of explanation. It is said that the original publication regarding the proposition outlined in the De Graw order "appeared in July last, and nothing having been heard against it, the order was accordingly issued." From this it would appear that the Department gave full notice of its intention at least two months before the matter was taken up in this correspondence or elsewhere. As a matter of fact, the Department gave to the Associated Press a brief bulletin describing in general terms the proposed De Graw order. Before publication, however, this bulletin was condensed in such a manner that all the features of the order were eliminated except that providing for the numbering of letter boxes on rural routes. As there was no objection on any score to that feature of the order very little attention was paid to it. It will be remembered also that the most objectionable feature of the proposed innovation—namely, that permitting postmasters to supply applicants with the number of routes and boxes thereon emanating from their respective offices—was not included in the original De Graw order. Under these circumstances, therefore, it is quite clear why the original announcement by the Department did not attract attention, or evoke any of the protests which have since flooded the Fourth Assistant's office.

Special Agents' Reports.

The last of the reports of the special agents detailed to investigate this important question has been received at the Department. No more interesting information with regard to the attitude of the retail merchants of the country toward the catalogue houses, the rural free delivery and the Post Office Department has ever reached Washington. As foreshadowed in this correspondence, the great mass of evidence is in favor of the contentions set forth in the protests that have reached the Department; but it is to be regretted that a few retail merchants, who doubtless have not yet felt the competition of the monopolistic catalogue houses, have professed a feeling of indifference and have assured the inspectors of their confidence in their ability to "take care of themselves" in any contest with mail order concerns. An even more significant development, however, is the evidence which these reports contains that the work of Superintendent Machen, under his famous order of December, 1903, permitting mail order houses to obtain lists of patrons of rural routes, was so thoroughly done in certain sections that the De Graw order would be of little advantage to the catalogue houses; hence the local merchants in these particular sections express indifference regarding the enforcement of the De Graw order, which they think would add little to the damage already done.

A Mischievous Boast.

The action of retailers who profess their ability to maintain themselves against catalogue house competition, even when such competition is assisted by postal regulations, cannot be too strongly deprecated. Nine times in ten such assertions come from merchants whose territory has not yet been invaded by the mail order houses. In his fancied security the local retailer is disposed to boast of his ability to "take care of himself" and talks heedlessly on a subject which he but faintly comprehends. If his own interests alone were at stake it would be a matter of little consequence; he would doubtless change his mind in due season. In this case, however, he speaks as the representative of a great class of retail merchants and unfortunately he happens to have the ear of a post

office inspector. The very fact that among the large number of merchants interviewed by the Department's agents only a few have been found who take this peculiar view of the situation has induced the inspectors to magnify the importance of these utterances, which are given much more prominence in the reports than they deserve.

Machen's Order Still Felt.

But if a few careless statements have found their way into the record, they are much more than offset by the strong, not to say bitter, denunciation of the orders issued under the Machen *régime*, the effect of which in certain sections of the country will be felt indefinitely. Evidence continues to accumulate that Machen gave advance information to certain concerns regarding his forthcoming order permitting postmasters to supply applicants with the names and addresses of patrons of rural routes radiating from their offices, and that as a result a comprehensive system of securing this information was employed which covered county after county in some of the most populous and prosperous sections of the Middle West. One retail merchant, in commenting on the De Graw order, tells an inspector that the mail order concerns have thus obtained the names of every one of his customers, and he therefore feels no further interest in the Department's action, taking the position that the horse has been stolen and that it is idle under the circumstances to make any effort to lock the barn door. It appears also in this connection that the mail order concerns, having once obtained lists of patrons of rural routes, are enabled to have them corrected from time to time by some customer on the route in consideration of a cheap premium.

The premium plan, it appears, is also being utilized by the mail order concerns in virgin territory. Through ingenious advertising, these concerns obtain the names of boys and girls living on rural routes and employ these children to make up complete lists of patrons of their respective routes. In one case a boy who furnished a list received a football for compensation, but in other cases more valuable gifts have been presented, and in some sections competitions have been instituted with prizes for the boys submitting the longest lists.

The Catalogue Houses Seem to Have Abandoned

their efforts to induce rural carriers or local postmasters to violate the regulations by furnishing names and addresses. This is believed to be due to the action taken by the Department in notifying certain concerns that their propositions to postmasters and carriers involved violations of the law and that all employees transgressing the regulation would be promptly dismissed. The managers of the mail order houses doubtless realized that the Department meant to keep its word and that the consequences might be disastrous. It can be stated on the best authority that if any further abuses in this direction had been discovered the matter would have been turned over to the Department of Justice for appropriate action.

The movement described in *The Iron Age*, 5th inst., to form an affiliated organization in the various trades which have common aims, especially with regard to Federal legislation, which resulted in the formation of the Affiliated Presidents and Secretaries of Commercial and Trade Organizations, is being followed by postal officials here with great interest. No department of the Government is charged with functions of such importance to these trade organizations as the post office, and the Department realizes that it must rely in the future, as it has in the past, upon the co-operation of trade associations to prevent the passage of legislation believed to be detrimental to the postal service. W. L. C.

THE INDIANA ROLLING MILL COMPANY, New Castle, Ind., which as the Indiana Shovel Company manufactures a large line of Shovels, Spades, Scoops and Drain Tools, is also making a line of Harrow Disks and reports that it is installing new machinery to cut to shape all kinds of agricultural material used by Implement manufacturers. In this manner the company expects to consume its entire output of sheet steel.

SOUTHERN HARDWARE JOBBERS.

THE recent obnoxious order of the Post Office Department in regard to Rural Free Delivery, which has been temporarily suspended and will probably be revoked, is the subject of a circular letter addressed to the members of the Southern Hardware Jobbers' Association by C. B. Carter, secretary-treasurer, Knoxville, Tenn., in which they are urged to protest promptly and vigorously against this radical departure on the part of the Government.

The following standing committees have recently been appointed by the president of the association:

SUPPLY COMMITTEE: J. D. Moore, Birmingham, Ala; E. A. Peden, Houston, Texas; A. B. Palmer, Savannah, Ga.

METAL COMMITTEE: Bruce Keener, Knoxville, Tenn; C. B. Hancock, Bluefield, W. Va.; William M. Teague, Jr., Montgomery, Ala.

TRANSPORTATION COMMITTEE: W. E. Newill, Atlanta, Ga.; H. B. Miller, Memphis, Tenn.; Hugh Fox, Pine Bluff, Ark.

PRESS COMMITTEE: O. B. Barker, Lynchburg, Va.; G. H. Lyon, Little Rock, Ark.; S. E. Clarkson, Oklahoma City, Okla.

MANUFACTURERS' COMMITTEE: R. M. Dudley, Nashville, Tenn.; J. C. Bering, Houston, Texas.; Col. B. F. Eshleman, New Orleans, La.

GRIEVANCE COMMITTEE: James Moroney, Dallas, Texas; C. W. Turner, Muskogee, I. T.; Buck Williams, Fort Smith, Ark.

MEMBERSHIP COMMITTEE: R. D. Warren, Memphis, Tenn.; R. F. Bell, Fort Worth, Texas; G. W. Barnett, Montgomery, Ala.; Lee Richardson, Vicksburg, Miss.; John Donnan, Richmond, Va.

A Horseshoe Episode.

THERE has been of late some slight irregularity in the price of Horseshoes, which, however, appears to be correcting itself, although at one time it threatened more serious consequences. The disturbance was caused by the sending out of low prices on these goods by a well-known catalogue house, and the wonder was how it was able to do so in the presence of a regular and well controlled market. A knowledge of the facts in the case makes the episode decidedly interesting.

As understood in the trade, the facts are that a company in the Northwest, originally operated by individuals without sufficient previous experience, was reorganized under the auspices of Hardware jobbing interests by whom some of the capital was furnished. Its chief executive officers were taken from prominent Hardware jobbing concerns, the secretary occupying an official position in an influential jobbing association. At the same time the Horseshoe company inherited and retained under the reorganization its former status in the Horseshoe pool. The idea underlying the enterprise was that the factory should manufacture Horseshoes for the group of jobbing houses interested in it. It was anticipated that these houses would take up all its output so that it would not be necessary for the plant to seek a market among the trade outside their own circle. Circumstances so developed, however, that it was desirable for financial or other reasons to dispose of a round lot of Shoes to outside parties, and the result was that an arrangement was concluded with one of the best known catalogue houses by which the latter was to take 20,000 kegs of Horseshoes at, it is said, $3 per keg. Under this arrangement the Shoes were put on the market as made by the Bentley Horseshoe Company, thus bearing the name, it is said, of one of the buyers in the catalogue house. A 16-page price current was at once issued broadcast containing descriptions and prices of Horseshoes and numerous other commodities peculiar to the blacksmith and horseshoeing trade. This announcement by the catalogue house was made, as shown in the reproduction of the first page of the circular as given on the opposite page.

It will be seen that the Shoes were offered at $3.25 per keg of 100 pounds, f.o.b. Chicago, those made of iron being offered at $3.50 per keg. As Horseshoes are regularly sold f.o.b. Pittsburgh, and as the freight is 16½ to 20 cents per 100 pounds, Pittsburgh to Chicago, according to quantity, the price named was really $3.25 and $3.50 to the consumer on Steel and Iron Shoes respectively in Chicago, against, say, $3.65 to $3.90 to the Chicago jobber in less than carload lots, after deducting extreme rebate and adding Pittsburgh freight.

It is noticeable that the Shoes were advertised as made by "one of the largest Horseshoe makers in Amer-

$3.25 PER KEG OF 100 POUNDS FOR BEST HORSESHOES MADE

TWENTY THOUSAND KEGS TO BE SOLD AT $3.25 PER KEG OF 100 POUNDS

SPECIAL TO HORSESHOERS AND BLACKSMITHS:
You should take advantage of this wonderful sale and order shoes enough to last you at least six months or a year, for at our special $3.25 price you will be saving about one dollar per keg, and we guarantee you will be getting the highest grade horseshoes made in America.

HOW WE CAN MAKE OUR $3.25 PRICE.

One of the largest horseshoe makers in America, a concern having large interests in the East and in the West, a concern that is making shoes for nearly all the jobbers or wholesale dealers in horseshoes in this country, horseshoes that are known and used by nearly every horseshoer in America, a concern whose name is not only known but very familiar to almost every horseshoer in the land; this concern was overstocked on their highest grade horseshoes. They found it necessary to find a buyer for 20,000 kegs of shoes for spot cash. We made them an offer, which offer was accepted, and as a result we can offer you these shoes at **about $1.00 less than the exact same shoes are today being wholesaled by jobbers everywhere.** Our price to you represents the actual cost to us, the price we paid per keg for the entire 20,000 kegs, with but our one small percentage of profit added. This price of $3.25 per keg of 100 pounds will hold good until the entire stock is exhausted.

NAME OF SHOES AND NAME OF MAKER.

If we could give you the name of the manufacturer who made the shoes, or the name of the shoes, you would know at once what they are. No doubt they are the exact same shoes you are now using, surely they are the same make and brand of shoes that you have often used, but one of the conditions of the purchase was that we were not to advertise them under the maker's name or maker's brand, the manufacturer taking this position, that in offering these shoes at $3.25 we are selling them at a much lower price than the jobber or wholesaler is compelled to pay the manufacturer, selling them at **about $1.00 less than the wholesalers sell the exact same shoes to the retailer or blacksmith trade.** To advertise the name of the maker or the brand would be to certainly injure the manufacturer's business and business relations with the different jobbers of horseshoes throughout the country

QUALITY GUARANTEE AND FREE TRIAL OFFER.

Every one of these shoes is guaranteed for quality, guaranteed strictly first class, guaranteed the highest grade shoes made, the equal of any shoes on the market, regardless of name, make or price, guaranteed to satisfy the buyer in every way, guaranteed in every way the equal of shoes you are now paying $4.25 and upwards for, and any order you send us for these shoes will be shipped with the understanding and agreement that if you do not find them perfectly satisfactory, strictly first class, if you are not satisfied you have made a big saving in cost you can return the shoes to us at our expense, and we will immediately return any money sent us, including any freight charges paid by you.

ABOUT THE FREIGHT CHARGES.

Horseshoes take the lowest freight rate (4th class), and our special $3.25 price is for the shoes in kegs and delivered on board the cars in Chicago. The freight per keg on shoes to points within 50 to 700 miles from Chicago is from 10 cents to 40 cents, according to distance. The freight will amount to next to nothing compared with what you will save in price.

YOU HAVE BEEN OVERCHARGED ON HORSESHOES.

We are informed by the best of authority that the highest grade iron or steel horseshoes can be produced at a manufacturing cost of from $2.00 to $2.50 per keg of 100 pounds, and yet you, a blacksmith or horseshoer, have been compelled to pay $4.00 to $4.50 per keg and upwards. This condition, we can assure you, is through no fault of the jobber (the wholesaler who sells you). His profit is small enough; in fact, we are informed by very good authority that the wholesale dealers in Chicago pay for iron shoes $3.86 per 100-pound keg, less 2 per cent discount for cash in ten days, or about $3.78 net; in turn they sell them through their travelers or by catalogue to the horseshoers and blacksmiths of the country at from $4.00 to $4.50 per keg, and considering the price they pay for them no one can complain that the jobber or wholesaler gets too big a profit, or is in any way responsible for the unreasonably high price at which shoes are sold to the horseshoer. The big profit is with the manufacturer. If it is true (and we have no reason to doubt the correctness of our information) that the manufacturer can produce these shoes at from $2.00 to $2.50 per keg, then he is exacting a profit on every keg of horseshoes he makes of from $1.25 to $1.75, whereas he should be satisfied with a profit, at the most of 25 cents a keg, especially when you consider that a number of the horseshoe factories make nearly one thousand kegs of shoes per day, and where a thousand kegs and upwards are made in a single day, and if the manufacturer was to sell these shoes at a margin of 25 cents per keg his net profit in a day would be $250.00 and upwards, ample profit, we should say, to satisfy any reasonable manufacturer; but with a profit of $1.25 to $1.75 per keg he is, in our judgment, taking from the blacksmiths and the horseshoers of the country from $1.00 to $1.50 more profit on every keg of shoes he makes than he is justly entitled to.

DO YOU WANT TO BUY YOUR HORSESHOES CHEAPER?

If you do, we ask your support in this, our effort to break down the long margin of profit that the horseshoe makers of the country have been taking. We need your assistance in the way of orders. Send us money for as many kegs as you can at our special price of $3.25 per keg of 100 pounds for steel shoes, or $3.50 per keg of 100 pounds for iron shoes, and before this stock of 20,000 kegs is exhausted we expect to effect arrangements whereby we can supply you in the future, if not at these special prices of $3.25 and $3.50 per keg, we can at least supply you at prices much lower than you are now paying.

TERMS OF SHIPMENT.

While nearly all of our customers send cash in full, and we advise that you send cash in full with your order, if you prefer to see and examine the shoes before paying for them, you can order as many kegs of shoes as you like, enclose enough money with your order to cover the freight charges both ways, say two or three dollars, according to the number of kegs ordered, we will send the shoes to you by freight C. O. D., subject to examination, balance to be paid at your railroad station when you receive the shoes. Under any circumstances, whether you send cash in full or a small remittance, balance payable after received, you will have the privilege of seeing and testing the shoes to your entire satisfaction, and if you are not convinced they are the highest grade, the equal of any shoes you ever used, regardless of price, you can return them to us at our expense, and we will return your money, together with any freight charges paid by you.

SAMPLE SHOES FREE.

While we especially urge that you send us an order, as selected from this circular, fill out one of the enclosed order blanks, enclose our price, let us send the shoes to you with the understanding that they can be returned to us and your money returned to you if they are not perfectly satisfactory; however, if you would like to see a sample of the shoe and examine it before sending us an order, we will be glad to send you a sample shoe by mail, postpaid, free with our compliments.

If you will simply say, "Send me a sample horseshoe, according to your offer," we will send you one of these shoes by return mail, postpaid, free with our compliments. You can see it, examine it, compare it with the shoes you are now using, test it out in every way, and if you do not find it in every way the equal of the best shoes you ever used, and are not convinced you are making a big saving in cost, we, of course, will not expect your order.

We are among the largest dealers in this country in blacksmiths' tools and supplies of all kinds. We want your trade and we need your help. A little help on your part and we feel sure we can make arrangements whereby you will never again be compelled to pay such exorbitant prices for horseshoes. The shoes we have to offer at $3.25 for steel and $3.50 for iron, are furnished in all the different sizes and styles, as shown in the illustrations and descriptions and offered in the various weights at the special inside prices quoted.

First Page (Slightly Reduced) of Horseshoe Circular Issued by Chicago Catalogue House.

ica," "a concern that is making Horseshoes for nearly all the jobbers or wholesale dealers in Horseshoes in this country," &c., and backed by a guarantee as "strictly first class, highest grade Shoes made and the equal of any Shoes on the market regardless of name, make or price." It was further impressed on the possible buyer that the price quoted was about $1 per keg under the regular price, and it was asserted that the best grade of Iron and Steel Horseshoes could be produced for from $2 to $2.50 per 100 pounds.

Notwithstanding all the beautiful things said about the goods, the practical horseshoers are said to have returned many of them, which finally resulted in cutting the original purchase from 20,000 to 10,000 kegs and the withdrawal by the catalogue house of the guarantee. Whether the mill which has caused this disturbance in the market will continue to be operated remains to be seen. It is understood that its pathway has been far from smooth, and it is suggested as possible that it may be abandoned, or that another reorganization of its affairs may be necessary.

The latest development in its career as narrated above is certainly one that gives ground for reflection in regard to some questions which agitate the trade at this time. Some of these are referred to in the editorial columns of this issue.

FACTORY COST AND BUSINESS METHODS.

MODERN COMMERCIAL AND INDUSTRIAL ACCOUNTING PRACTICE.

BY HERBERT FOSTER, NEW HAVEN, CONN.

In the fourth article of this series, which was published last week, the method of arriving at the cost of productive labor was illustrated and described; also a practical machine shop system.

Fifth and Concluding Article.

Epitome of Information for the Executive Head.

In large establishments the conduct of affairs is usually vested either in an individual or a representative of

Daily Sales Nov. 10th

	1904	1903	1902
House	7 510 70	1 579 85	1 601 30
N.Y. Branch	3 719 85	2 810 15	2 995 10
Chicago "	1 976 10	2 370 76	1 895 75
TOTAL	7 706 65	6 760 76	6 792 15

Fig. 10.—Comparative Statement of Daily Sales.

the executive board of management. Obviously it is an impossibility to keep closely in touch with all the multitudinous and inevitable details of an extensive business by personal observation of the same each day.

Sales week ending Nov. 16th

	1904	1903	1902
House	17 095 75	8 990 18	7 016 90
N.Y. Branch	19 005 15	6 010 25	15 795 55
Chicago "	14 799 84	15 174 17	19 910 70
TOTAL	45 900 74	40 174 55	35 723 15

Fig. 11.—Comparative Statement of Weekly Sales.

He or they must therefore be provided periodically by the heads of departments with a condensed statement of information, that the pulse of the business may at all times be at the executive's finger ends, so that he may endeavor to keep it as nearly normal as possible. This information should be presented daily, weekly and monthly, as the business conditions may demand.

DAILY.—Upon the manager's desk should be placed a statement of the finances, amounts of cash on hand and in various banks, amounts of notes receivable on hand and notes payable outstanding, &c. From the sales department a statement showing the previous day's sales, and for comparison the amount for the same date in several previous years, Fig. 10.

WEEKLY.—From the sales department a detailed statement showing sales for the current week by representatives from the home office, by branches, &c., and also the amounts for the corresponding period of several previous years, Fig 11.

MONTHLY.—From the sales department a detailed statement for the month similar to that furnished for each week, showing in further detail the sales separated into the various classes of goods, with the amounts for the corresponding period of the previous year in this case also, Fig. 12.

From the accounting department a copy of the trial balance of the Private Ledger (Fig. 1); a copy of the total column of the Department Account Ledger (Fig. 2), giving the details of the controlling accounts in Private Ledger. A monthly estimated income statement, showing the estimated net earnings and approximate inventory to date, as follows (taking as the basis the figures as for November 30, shown in Fig. 2):

ESTIMATED INCOME STATEMENT, NOVEMBER 30.

Gross sales		$913,113.29
Returns and allowances		17,683.10
Net sales		895,430.19
Cost of goods sold		626,801.00
Manufacturing profits		268,629.19
General, selling and admin. expenses		164,059.95
Operating profits		104,569.24
Other income		257.85
Less:		104,827.09
Interest and discount	$10,508.01	
Cash discounts	30,575.15	
Loss and gain	8,710.96	
		49,794.12
Estimated net earnings to date		$ 55,032.97

Also a monthly profit and loss statement showing the condition of the business to date. In all respects this is made up the same as the annual statement, except that the amount of profit is shown as an item instead of being included in the surplus account.

The basis of this statement includes the figures used in the "estimated income statement." Note the amount of profit is the same:

MONTHLY PROFIT AND LOSS STATEMENT, NOVEMBER 30.

Assets.

Real estate and buildings		$53,375.00
Machinery		124,254.92
Tools		78,175.90
Notes receivable		12,370.50
Accounts receivable	$372,985.35	
Less reserve	18,649.25	354,336.10
Cash on hand		14,416.53
Suspense account		1,050.10
Estimated accrued dividends due from insurance		3,707.00
Estimated inventory of merchandise, material, &c		511,432.96

Sales month of November 1904.

Salesman	TOTAL	LAMPS	GAS FIX.	NICKEL
John Doe	25 370 78	5 775 25	18 995 10	6 447 43
Richard Roe	30 985 94	4 101 77	24 219 65	2 516 54
N.Y. Branch	65 107 66	20 710 90	43 007 10	13 749 66
Chicago "	98 774 30	30 987 55	61 078 75	6 208 20
	219 688 68	61 575 77	147 351 10	10 811 86

For 1903

John Doe	20 375 95	4 270 95	14 103 70	1351 30
Richard Roe	25 107 60	6 175 00	16 901 17	2031 43
N.Y. Branch	53 009 10	19 895 60	31 196 70	1916 80
Chicago "	79 985 77	37 798 65	39 610 10	13 577 02
	178 481 37	63 790 70	96 111 67	18 576 50

Fig. 12.—Comparative Statement of Monthly Sales.

Liabilities.

Capital stock		$350,000.00
Surplus		510,908.75
Notes payable		180,000.00
Accounts payable		33,574.29
Depreciation accrued		20,603.00
Total assets		$1,150,119.01
Total liabilities	$1,095,086.04	
Estimated net earnings to date		55,032.97

As all this information is to be contained in one book, with expansible back, it will readily be seen that as several years' work is secured the value for comparison is inestimable.

Then for further information of a statistical nature a series of graphic charts showing amounts expended for materials, total manufacturing expenses, labor, selling expenses, and one for sales, is recommended. An illustration is shown in Fig. 13. By means of these charts, as different colored ink is used for the lines to designate different years, it is possible at a glance to observe the fluctuations for each month for a series of years and to at once secure information as to the causes, if any great variation exists.

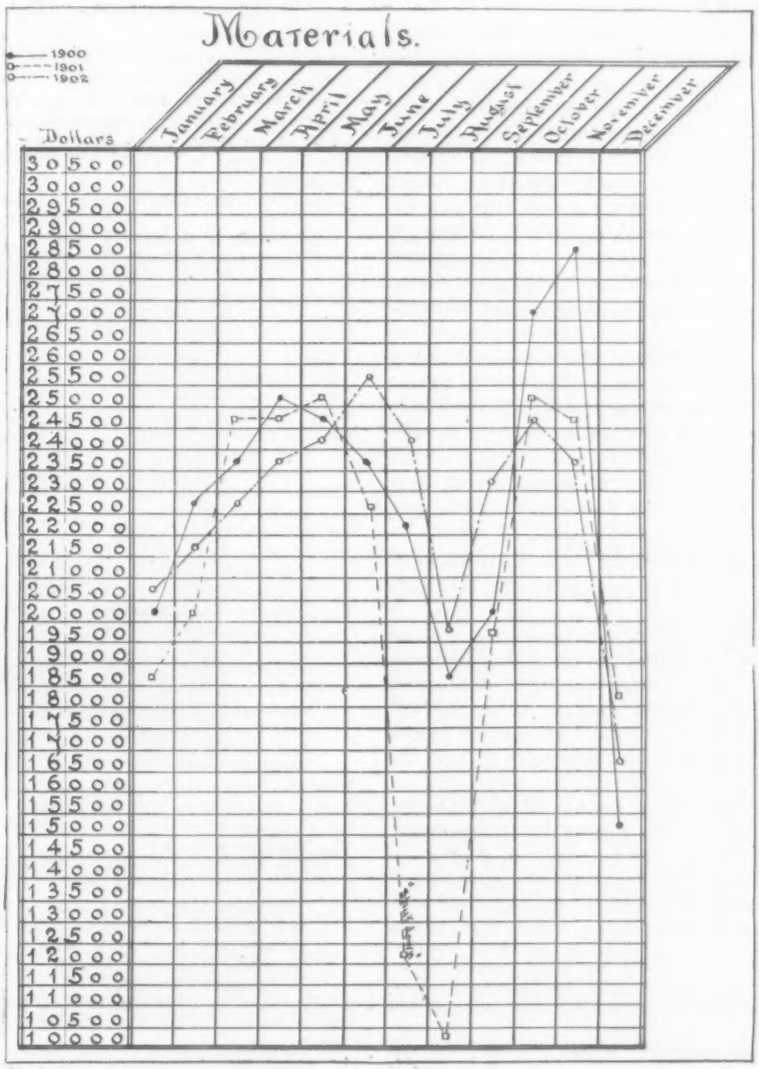


Fig. 13.—Graphic Chart for Comparison of Amounts Expended During Corresponding Months for Several Years.

To all who have given any study or thought at all to the perplexing problem of costs it must be evident that while, like bookkeeping, the same fundamental principles are involved, yet the same rules arbitrarily laid down cannot be applied to all cases alike. There must be modifications of methods to suit different lines of business. This is where the trained and competent accountant is enabled to demonstrate his ability and value by exercising the knowledge he has acquired, and unless he has the necessary knowledge of manufacturing as well as the scientific method of treating accounts and, above all, is thoroughly earnest in his efforts to produce accurate and perfectly reliable results, his work is useless, no matter what method or system he may use to obtain them.

THE END.

THE JOHN M. HART COMPANY, Chicago, has been incorporated under the laws of Illinois to do a jobbing business in Wooden Ware, Paper, Cordage, Glassware and Hardware specialties. John M. Hart, one of the members of the firm, had for the past 14 years been connected with the Crunden-Martin Wooden Ware Company and at the time of his retirement was secretary of the concern. A. H. Wernse, who is associated with Mr. Hart, has had 20 years' experience in the Wooden Ware business, serving successively with the Samuel Cupples Wooden Ware Company, the Ault Wooden Ware Company and the Crunden-Martin Wooden Ware Company. The offices of the John M. Hart Company are in the Ashland Block, Chicago.

THE very complete catalogue recently issued by the St. Louis Shovel Company plant of the Ames Shovel & Tool Company, St. Louis, Mo., contains a description of something over 1000 styles and grades of Shovels. The arrangement of the catalogue, also, with the list prices opposite each size of each grade or style of Shovel, makes it possible for a buyer to tell at a glance what is the net price. The company has extended its line with special reference to Telegraph, Railroad and Contractors' Tools, of which a specialty is made.

The R. U. Ullrich Hardware Company, Mt. Clemens, Mich., has been incorporated with a capital of $28,000 to conduct a Hardware, Stove, Heating, Paint and Sporting Goods business.

THE CONDITION OF THE SHOVEL INDUSTRY.

A PROCESS of readjustment has recently been taking place in the Shovel and Spade industry. Conditions have been such that many weak concerns were forced out of business; others of wider scope discontinued production in this direction, diverting their capacity to other lines, while reorganizations, receiverships and similar indications of continued storm and stress have been observed in many quarters. Low prices are in force as a result of competition in which existence itself was often the stake and the market is still referred to as being demoralized. In such conditions we hear the most pessimistic opinions as to the future from the point of view of the manufacturers. Studied broadly, however, the situation appears to be not without elements on which an attitude of hopefulness may be based.

The observation is trite but true that bad matters often look worst just when they are ready to mend. Thus the depressing phenomena now engrossing us may be final phases of the economic blood letting by which the inexorable law of supply and demand is enforced in this department of trade. This opinion is sustained by reviewing briefly the causes of the present situation. Some years ago, during a period of great prosperity and expansion, an attempt was made to control the country's output of Shovels, but in the confidence of apparent success a policy was instituted which strengthened existing competition and encouraged new producers to enter the field. The market was soon heavily overloaded, affording no outlet for the product of the associated manufacturers who were attempting to maintain high prices. A sweeping reduction was made, but disruption inevitably followed. In the subsequent struggle to hold or reclaim trade concerns with best facilities sold certain grades of Shovels at prices closely approximating actual cost, which could only represent heavy loss and result in ultimate disaster for those less favorably situated. Some, as has been said, were able to quit the field and turn their attention to more profitable lines; others were forced to the wall; the fittest survived.

This, then, is the situation that exists to-day. As previously suggested, it is not without encouraging features. Two years of such drastic purgation have eliminated many if not most of the weaker factors in the market. Production has decreased and consumption has increased with the growth and expansion of the country. True, the argument is advanced that muscle is giving way to steam, but in none of the excavation or construction employing machines may the use of the Shovel be disregarded. Large undertakings increase and multiply, and of small ones there is no end, while the requirements of the average individual or community certainly do not grow less. In Canada, for instance, consumption is increasing rapidly as a result of railroad building and the influx of population in the Northwest, and capital has been interested to establish two new plants, which will double the present output of Shovels and undoubtedly meet the demand for some time to come.

Manufacturers in this country agree that the volume of business has been good and is showing improvement. Some fairly large orders are being placed, especially by jobbers, who show a willingness to use better grades than those on which competition has centered. Stocks have everywhere been kept down because of the irregularity of the market, but there are shrewd buyers who are now disposed to anticipate their requirements, partly because conditions have been unfavorable to the manufacturers for so long. Attention must be paid, moreover, to the tendency of other lines, especially those entering into the production of the goods in question. Steel, Handles and Rivets are all higher and advancing, and the opinion is expressed that manufacturers of Shovels will hardly continue much longer to make contracts for cheaper grades at present prices. Indeed it is argued that just as many if not more goods could be sold on a better margin of profit, since an advance would stimulate the market.

NEW YORK JOBBERS' ASSOCIATION.

AT THE annual meeting of the New York State Association of Hardware Jobbers, held at the Fort Orange Club, Albany, N. Y., on Thursday, October 12, the following officers were elected: President, J. H. Underwood, Binghamton; vice-president, A. J. Lowery, Utica; secretary-treasurer, Joseph Born, Syracuse; directors: Hobart Weed, Buffalo, and Irving D. Booth, Elmira.

CONTENTS.

MR. BIGELOW'S FIFTIETH ANNIVERSARY.

SAMUEL A. BIGELOW, president of the National Hardware Association and president of the Bigelow & Dowse Company, Boston, Mass., observed the fiftieth anniversary of his entrance into the hardware business, Friday, October 13. Mr. Bigelow received many surprises during the day, a host of his friends in the trade all over the country remembering him by telegram or letter, extending warm congratulations upon the rounding out of a half century of active and successful business life, much of which has been devoted to the building up of the well-known house of which he is the head. The Executive Committee of the National Hardware Association presented him with a splendid mahogany chair, handsomely upholstered in leather. The employees of the company sent a magnificent bouquet of 50 American beauty roses. Another bouquet came with the card, "Your Boston jobbing friends and neighbors hope to greet you on your hundredth anniversary."

The gift of the officers of the National Association was accompanied by a letter from T. James Fernley, secretary-treasurer, to the following effect:

On behalf of your fellow officers, members of the Advisory Board and Executive Committee of the National Hardware Association I ask you to accept the office chair sent you to-day as a souvenir of the anniversary which you celebrate on Friday, October 13.

SAMUEL A. BIGELOW.

It is a very rare privilege to be enabled to complete a half century in commercial life. Indeed, of those who start in the race but few are permitted to pass the fiftieth milestone. You are to be congratulated on this anniversary occasion, not only because you have been able to continue in the race, but that this anniversary day finds you equipped mentally and physically for a continuance in the same.

We do not ask that you accept this souvenir because of its intrinsic value, but simply as a slight token of respect from those with whom you have been associated during more than one-fifth of your commercial life in an effort to uplift this, your chosen business. It is generally recognized that you have made many sacrifices for your business association, and it must to-day be a source of a great deal of satisfaction to know that selfishness has been an unknown trait in your character.

The Hardware trade of the country is indeed proud of the record that you have made—50 years in one line of business in your city and no tarnish attached to your name. It is the earnest wish of your friends in the officiary of this association, whom I represent, that continued happiness shall attend your remaining days and that you may spend many restful hours occupying the trifling souvenir to which allusion is made.

Mr. Bigelow began his business career in 1855, the year of the founding of *The Iron Age*, when he entered the employ of the Hardware house of Eaton & Palmer on Congress street. The next year the firm consolidated with Lovett & Wellington as Eaton, Lovett & Wellington, and Mr. Bigelow was the only clerk of the old house who remained with the new. Beginning with a salary of $50 a year, in three years this had been increased to $125. He went through the successive minor positions in the store, finally becoming a salesman. In 1864 the firm of Homer, Bishop & Co. was founded, and Mr. Bigelow went with it and in 1866 became a partner in the business. For eight years he traveled for the house in Vermont and New Hampshire and built up a substantial business. The firm was dissolved in 1872 by the great Boston fire, which wiped out every Hardware jobbing house in Boston, and the new firm of Macomber, Bigelow & Dowse was formed. Mr. Bigelow took charge of the buying in 1873, with what success is evidenced by the growth of the business, now one of the most important in the country. John F. Macomber retired from the firm in 1884, and the new firm of Bigelow & Dowse was organized, consisting of Samuel A. Bigelow and Charles F. Dowse, and ten years later, in 1894, the business was incorporated under the name of the Bigelow & Dowse Company. In 1903 the establishment was destroyed by fire, but the same indomitable energy which characterized the work of the two partners overcame the obstruction to their business and plans quickly made were as speedily fulfilled, until the company now occupies a larger and better equipped home than ever before.

Mr. Bigelow was a founder and the first president of the New England Iron and Hardware Association. He was New England's only representative at the Cleveland meeting in 1894 which resulted in the founding of the National Hardware Association, and served as a member of the Executive Committee continuously with the exception of one year, until in 1903 the Atlantic City convention made him the president of the association, to which office he was re-elected last fall. He was among the founders of the Anvil Club, afterward known as the Hardware Buyers' Association.

The record of Mr. Bigelow is one of unusual interest and affords an inspiring example to the younger men of the trade, who may consider themselves to have succeeded well if, when their golden business anniversaries arrive, they can look back over a career as successful and honorable.

BUHL SONS COMPANY'S NEW CATALOGUE.

BUHL SONS COMPANY, Detroit, Mich., has just issued a fine new illustrated descriptive catalogue of 1630 pages, each 11 x 9¾ inches, bound in heavy board covers, loose leaf style, by means of which the volume can easily be kept in close touch with constantly occurring changes by the removal and substitution of leaves as occasion requires, thus adding new goods or changed lists and discarding dead matter. Even a cursory inspection of the catalogue impresses one with the constantly increasing variety of goods regularly carried in stock by the large wholesale houses. Briefly grouped the book contains large and wide assortments of mechanics' Tools, Builders' Material, Roofers' Supplies, Tinners' Stock and Metals, Sporting Goods, Cutlery and numerous kinds of Iron and Steel.

CHINESE BOYCOTT AGAINST AMERICAN GOODS.

THE opinion of merchants identified with the China trade is that while there is a relaxation in the boycott of American manufactures, no permament relief is probable until there is some legislative modification of the exclusion act that bars not only Chinese coolies, but merchants, scholars and other respectable and influential Chinese. There seems to be no objection on the part of the better classes of Chinamen to excluding the coolies, as their preference would be to have them stay at home rather than emigrate, but there is a deep seated and lasting objection to placing those of high and low degree on a common level.

While there has been a cessation of the worst feature of the boycott, this is attributed by those well informed and in close touch with the situation to market conditions. For example, a temporary scarcity of goods in sight there, for the time, causes Chinamen to buy American products that would be ignored were goods originating elsewhere available; hence the belief that only a concession by Congress modifying the unreasonable features of the exclusion act will afford permanent relief.

It has been said that the agitation, which began last

spring, was started by two clever Chinese merchants with large stocks on hand to make a scarcity of American products in that market, but even if so they probably merely took advantage of a favorable situation, hoping to sell their own merchandise at higher prices when other importations ceased. Be that as it may, it is conceded by exporters in this market that for nearly sixty days the withholding of orders for American goods was practically absolute. Cotton goods have been ordered freely for some time past, however, and the paralysis in other lines is not so severe since the boycott began to weaken about September 1.

AMONG THE HARDWARE TRADE.

R. O. Porak has engaged in the retail Hardware business at Connell, Wash.

I. H. Dauer has succeeded Dauer & Hogan in the wholesale and retail Hardware business in Heyburn, Idaho.

Charles Holmes, Dunlap, Ill., has sold his Hardware business to Christopher & Ashbaugh.

A. D. Seybolt & Co., Western, Neb., has bought the Hardware, furniture and Harness business of E. E. Gustin.

T. J. Brus has purchased the retail Hardware business of Mann & Lemley, Washington, Iowa.

E. C. Fitch, Overbrook, Kan., has sold his Hardware, Stove and Sheet metal business to W. M. Hopkins.

The Baltzell Donaldson Company, Hammond, La., was burned out recently, the damage amounting to about $6000. The stock will be replaced as quickly as possible.

Green & Ericson have purchased the Hardware, Stove, Tinware and Paint business of Carlson & Olson, Stromsburg, Neb.

The Odessa Hardware & Implement Company, Odessa, Wash., is erecting a new business block which it will occupy as soon as completed.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our catalogue department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

McCRAY REFRIGERATOR COMPANY, Kendallville, Ind.: Series of artistic and complete catalogues referring to Refrigerators and Cooling Rooms for apartments, residences, restaurants, hotels, clubs, institutions, groceries, meat markets, florists, &c.

PORTLAND CORDAGE COMPANY, Portland, Ore.: Catalogue No. 4, referring to Cordage for all purposes, and containing cipher code, tables of weights and strength and much technical information of value to the trade.

ARCADE MFG. COMPANY, Freeport, Ill., Herman Kornahrens, 109-111 Murray street, New York, agents: Catalogue of Coffee Mills, Household Novelties and Light Hardware Specialties.

ATWATER MFG. COMPANY, Southington, Conn.: Standard revised list prices on Clips, Couplings, King Bolts, Body Loops and other Carriage Forgings.

DEMING COMPANY, Salem, Ohio: Illustrated catalogue G, referring to Pumping Machinery for operation by any power, including single and double acting Triplex Pumps, Power Deep Well Working Heads, Artesian Well Cylinders, Rotary and Centrifugal Pumps, &c. Much useful information is appended, together with a number of valuable tables.

STANDARD SCALE & SUPPLY COMPANY, Pittsburgh, Pa.: Illustrated price-list No. 8, referring to "The Standard" Scales for all purposes and containing telegraph code.

RICHARD ECCLES COMPANY, Auburn, N. Y.: Catalogue and price-list of Carriage and Wagon Makers' Forged Irons based on the new standard lists in effect July 1, 1905.

INDIANA MFG. COMPANY, Peru, Ind.: Catalogue and price-list of North Star and Indiana Refrigerators.

THE GOODWIN & KINTZ COMPANY, Winsted, Conn., Supplement No. 25, for use in connection with its catalogue No. 24, illustrating, with prices, Vases, Candelabra, Candlesticks, Clocks, Bronzes and premium goods.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate.

FROM THE COLVILLE HARDWARE COMPANY, Colville, Wash., which is about to open a retail Hardware, Stove, Paint, Implement and Sporting Goods store.

FROM THE J. W. STEVENS HARDWARE COMPANY, Dayton, Wash., in which a half interest was lately bought by C. W. Vaughn.

FROM F. L. CHRONISTER, who has lately moved his Hardware, Stove, Implement, Paint, Vehicle, Saddlery and Sporting Goods business from Carlton to Canton, Okla.

FROM J. H. RUSSELL, New Boston, Texas, who has succeeded the firm of Russell & Willis in the general Hardware, Stove, Implement, Vehicle, Harness and Sporting Goods business.

FROM JOHN M. FITZGERALD, who will shortly establish a Hardware store at Taunton, Mass., carrying a line of Builders' and general Hardware, Cutlery, Paints, Oils, Varnishes, Wall Paper and Molding, and some Kitchen Furnishings. The store is 20 x 90 feet, with a basement and second-floor room 20 x 60 feet for storage. Mr. Fitzgerald has been for the past 24 years a clerk in the store of C. F. Savery, Taunton, and expects to open his new store about November 1.

FROM C. F. BUTLER, Hillsboro Bridge, N. H., who is considering putting in a line of Hardware and Paints.

FROM H. E. MASON, who has succeeded to the Hardware business of Mason Brothers at Weeping Water, Neb.

MISCELLANEOUS NOTES.

Refrigerators.

The Indiana Mfg. Company, Peru, Ind., maker of North Star and Indiana refrigerators, is now furnishing removable ice chambers for Nos. 0, 1, 2, 3 and 33 of the Indiana line. Several new sizes have also been added to this line, together with a number of cheaper chests, making up a very complete assortment.

Eclipse Bread Mixer and Kneader.

Manning, Bowman & Co., Meriden, Conn., and 25 West Broadway, New York have recently purchased the patent rights and are now marketing the Eclipse bread mixer and kneader, previously illustrated in these

columns. While the salient features remain the same, we are informed that various improvements have been made in the structural details that add materially to the efficiency and lasting qualities of the device. Where this mixer and kneader differs from others on the market is in the dasher or kneader, which remains stationary while the covered tin pail revolves, kneading the dough in three minutes, it is said, without touching with the hands. The dasher reaches from top to bottom, the mixer having a capacity of from one to ten loaves, in the one size. It is the intention of the manufacturers to at once arrange for demonstrations in suitable centers for the purpose of pushing the sale of the mixer.

Protection Brand Asphalt Ready Roofing.

The Asphalt Ready Roofing Company, 136 Water street, New York, is now manufacturing Protection brand asphalt ready roofing, which can be laid so that no nails are exposed. This roofing comes in rolls already surfaced with gravel or sand, and has a 6-inch lap edge which should be nailed to the roof boards. The next sheet overlaps and is cemented to the lap edge of the preceding sheet so that no nails need to be driven through from the weather surface. This avoids the danger of leaks

Protection Brand Asphalt Ready Roofing.

caused by nails rusting or being drawn out, leaving a hole for the water to pass through. Equal advantage is claimed for this product on roofs subjected to gases arising from boilers, locomotives, coke ovens, chemicals, &c., since it is stated that the nails need not be exposed to the gases, either from underneath or outside. It is further claimed that while any handy man should be able to lay this roofing, the work consisting only of nailing and cementing the joints, it is similar in effect to a built up gravel roof, the joints being so tight and strong as to amount to one continuous sheet. A descriptive booklet with samples will be mailed by the company on application.

New Hoe, Rake and Cabbage Harvester.

The illustrations shown herewith represent new articles offered by the American Fork & Hoe Company,

Fig. 1.—Boothby Toothed Hoe.

Cleveland, Ohio. The toothed hoe illustrated in Fig. 1 is recommended for use in grassy soil. It has solid socket,

Fig. 2.—Pine Needle or Mill Refuse Rake.

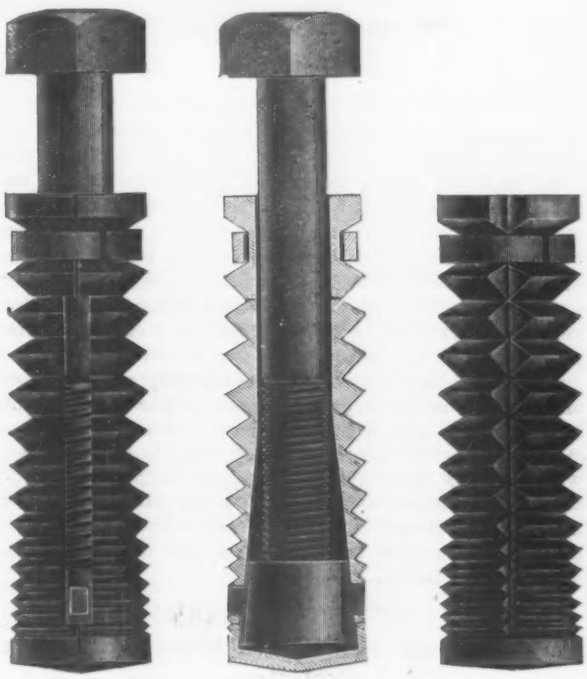
7½-inch blade and 4 1-3-foot handle. The pine needle or mill refuse rake, Fig. 2, is especially designed for raking pine needles in the South and may also be used for other refuse. The cabbage harvester, Fig. 3, has a sharp knife edge. With one stroke of the tool the operator

Fig. 3.—New Century Cabbage Harvester.

cuts off the cabbage head and then has a receptacle for holding it while loading.

The O. K. Expansion Bolt.

No. 1 of the accompanying cuts represents the expansion bolt complete. A sectional view is given in No. 2 with a part of the case removed, showing the inside construction, and No. 3 the outside case with deep grooves. The grooves serve the double purpose of making the malleable iron case flexible and also afford a gripping surface to engage the walls of the hole in which it is



No. 1. No. 2. No. 3.

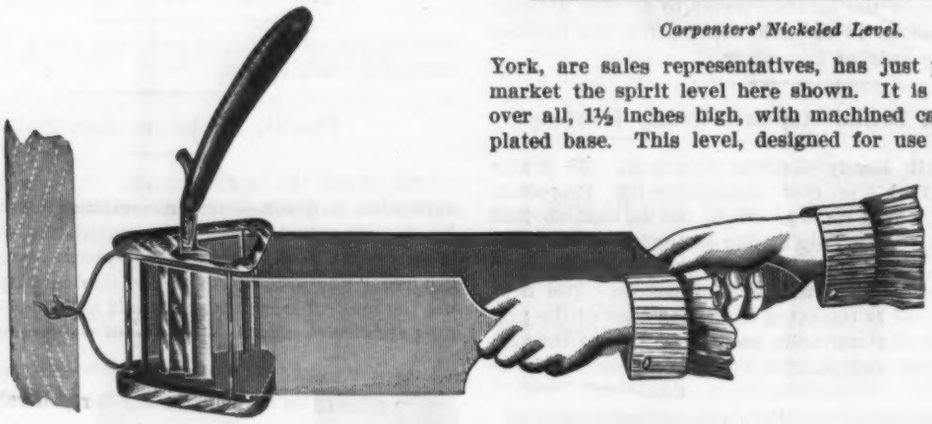
The O. K. Expansion Bolt.

placed. No sleeves are required between the case and the face of the wall, even if it goes deeper than the length of the case. The end of the bolt coming in contact with the rigid transverse webs at the end of the case will expand the case without other means, and will draw the work to be fastened against the wall in the same manner as if the bolt went through the wall with a nut on the other side. It is explained that the bolt cannot be pulled out of the wall without bringing some of the wall with it, and that there is no trouble in applying, as the bolt guide to the nut is perfect and the thread will always connect with the nut. The greatest expansion occurs at the inner end of the expansion case or at the bottom of the hole in the wall.

The nut being solid and of such length it is impossible to strip the thread on the bolt or in the nut. The machine bolt standard thread is used on all sizes, which gives more power in expansion than can be obtained with the log or wood screw thread. The device is being put on the market by Isaac Church, 1521 Walnut street, Toledo, Ohio, who states that the price of the device will permit its being used in all cases where expansion bolts can be used.

Automatic Razor Strop.

U. J. Ulery, 7 Warren street, New York, is marketing the Automatic razor strop No. 79, herewith illustrated one-third size. The metal portion is steel, nickeled and polished. In use the back of razor blade is inserted in a springlike holder, which grips firmly both sides of the blade, when by a quick movement backward and forward

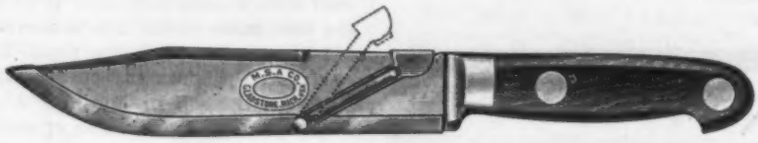


Automatic Razor Strop.

of the flexible leather strop it is drawn quickly and alternately against the edge from back to front. It is impossible to cut the strop, as each pull automatically reverses the blade, so that the sharpening and proper alignment of the steel particles of the edge is always in the right direction. The stropping leather passes over a steel roller back of the blade, when by means of a gear concealed in the inclosed bottom the razor holder, also geared, is turned in the correct direction according to the pull. Forward of the blade are two stationary rods, one on each side, inside of which is a movable rod on either side for the strop to pass over with little friction, but which serve as guides for the strop so as to always have the correct bevel in stropping. No skill is required and with ordinary care, even with the most inexpert, a razor can be quickly and easily stropped, the wire loop of the holder being caught in some convenient hook during the process. Each strop is packed in a neat cardboard box, 4 x 3½ x 2¼ inches.

Marble's Camp or Kitchen Knife with Edge Protector.

The camp or kitchen knife shown in the accompanying illustration is made with cocobola handle and 6, 7 or 8 inch blade, and is warranted perfect in material and temper. A protector is furnished with each knife, made of thin sheet steel lined with lead, weighing less than 1 ounce. The clasp, which has but one arm, is made of tempered spring steel. The shield is laid on the edge of the knife and when the clasp is pushed down it tightly grips the blade and a small tooth engages with a notch on the back of the blade. The protector takes the place of a bulky and heavy sheath and is designed for carrying sharp knives in picnic baskets, camp kits and packs,

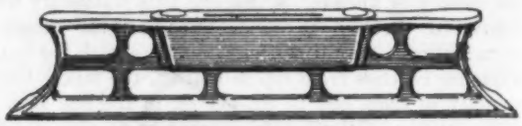


Marble's Camp or Kitchen Knife with Edge Protector.

or for keeping the edge keen while in the kitchen. It is explained that a notch may be filed in the back of any knife in connection with the use of the protector, which is sold separate for this purpose. The knife and protector are put on the market by the Marble Safety Axe Company, Gladstone, Mich.

Carpenters' Nickel Plated Level.

The Central Hardware Company, Philadelphia, Pa., for whom C. E. Peabody & Co., 155 Chambers street, New



Carpenters' Nickeled Level.

York, are sales representatives, has just placed on the market the spirit level here shown. It is 6 inches long over all, 1½ inches high, with machined cast iron nickel plated base. This level, designed for use of carpenters and similar workmen, can be profitably retailed at a very moderate price, even as low as 10 or 15 cents.

New Ideal Spring Hinge No. 1 S.

The screen door hinge illustrated herewith is the latest design manufactured by the Stover Mfg. Co., Freeport, Ill. Instead of the hinge containing two springs with ends resting on a cast hook, as in last year's pat-

New Ideal Spring Hinge No. 1 S.

tern, the spring is made of one piece and engages a wire hook, thus insuring smoother working and increasing the artistic appearance. This style hinge is referred to as being durable, as the spring has 12 coils, each of which stands an equal share of the strain in opening and closing.

T. St. Pierre, Concordia, Kan., has been succeeded by the Linville Hardware Company.

Neverslip Anchor Wedge.

The Neverslip Anchor Wedge Company, Auburn, N. Y., is introducing to the trade a new one-piece anchor wedge, as illustrated herewith. Fig. 2 shows how the barbed shank and projecting spurs of the wedge automatically lock it into the handle of an axe, hatchet or hammer by forcing the wood between them, the final anchorage being obtained at the point of greatest wedging power. In Fig. 1 the wedge is shown after being driven home in a hammer handle, where it is said not only to fix the head permanently but by closing the pores of the wood and rendering it impervious to moisture to preserve the life of the handle as well. The wedges are made in two sizes—No. 2-0 for hammers and No. 0 for axes. For the convenience of retail merchants the wedges are packed one-quarter gross of each size in a box.

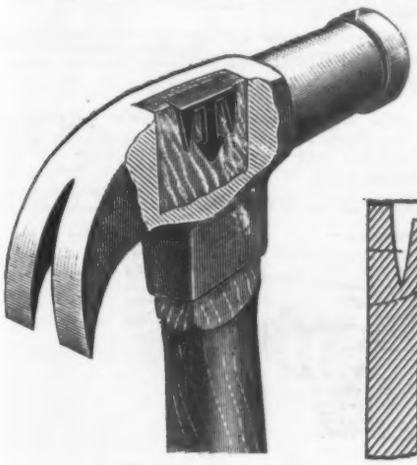


Fig. 1.—Neverslip Anchor Wedge Applied to Hammer.

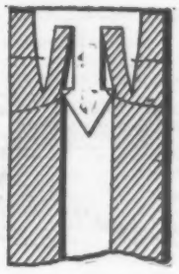
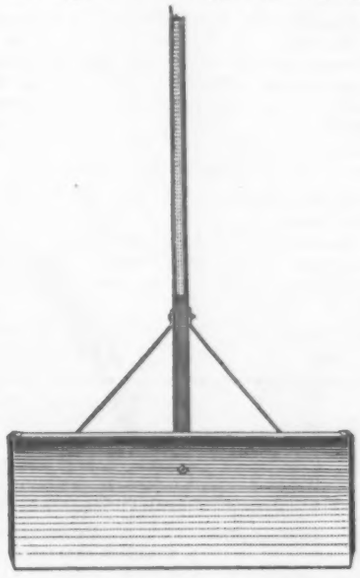


Fig. 2.—Sectional View.

Knowles Improved Asphalt Scraper.

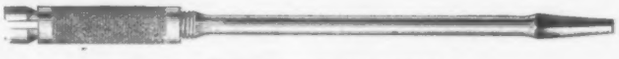
The asphalt scraper shown herewith is being put on the market by the Osborn Mfg. Company, Cleveland, Ohio. The scraper is of sheet steel, 13 x 30 inches in size, with a special long hardwood handle curved sufficiently to make it easy to use. The implement is designed for corporation work, being especially adapted to cleaning asphalt streets, bridges, sidewalks, &c. It is not only well adapted to this particular purpose, but is also alluded to as being handy for general use about the home.



Knowles Improved Asphalt Scraper.

Fray's Extension Bit Holder.

Herewith is shown an extension bit holder which is being put on the market by John S. Fray & Co., Bridgeport, Conn. It is designed to follow a 5/8-inch bit, the sleeve being under that diameter. The tool is made entirely of wrought steel, consisting of three pieces—a socket formed on the end of the steel extension and of the same piece of metal, a sleeve of drawn steel tubing and jaws of forged steel in one piece, fitting in the socket and formed by bending over the stock. The bit holder is nickel plated and is furnished in 12, 16 and 20 inch lengths, being packed a half dozen to the box in lengths as ordered, assorted if desired.



Fray's Extension Bit Holder.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal.
Linseed, City, raw	45 @46
Linseed, City, Boiled	47 @48
Linseed, State and West'n, raw	43 @44
Linseed, raw Calcutta seed	@62
Lard, Extra Prime, Winter	60 @61
Lard, Extra No. 1	47 @50
Lard, No. 1	37 @42
Cotton-seed, Crude, f.o.b. mills	19 @..
Cotton-seed, Summer Yellow, Prime	26 @..
Cotton-seed, Summer Yellow, off grades	@..
Sperm, Crude	55 @..
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	60 @63
Sperm, Bleached Winter	63 @65
Tallow, Prime	51 @53
Whale, Crude	@..
Whale, Natural Winter	42 @44
Whale, Bleached Winter	44 @46
Menhaden, Brown, Strained	27 @28
Menhaden, Light, Strained	28 @29
Menhaden, Bleached, Winter	30 @31
Menhaden, Ex.-Bld., Winter	31 @32
Menhaden, Southern	16 @16½
Cocoanut, Ceylon	℔ lb 6¼@6¾
Cocoanut, Cochin	℔ lb 7¼@ 7½
Cod, Domestic, Prime	34 @36
Cod, Newfoundland	38 @40
Red, Elaine	33 @35
Red, Saponified	℔ lb 4¼@ 4½
Olive, Italian, bbls	60 @62
Neatsfoot, prime	49 @50
Palm, Logos	℔ lb 6⅛@ 6¼

Mineral Oils—

Black, 29 gravity, 25@30 cold	℔ gal.
test	10½@11½
Black, 29 gravity, 15 cold test	11½@12½
Black, Summer	10½@11½
Cylinder, light filtered	18 @19
Cylinder, dark filtered	16 @17
Paraffine, 903-907 gravity	12½@13
Paraffine, 903 gravity	11½@12
Paraffine, 883 gravity	9¼@ 9½
Paraffine, Red	11½@13

In small lots ¼¢ advance.

Miscellaneous—

Barytes, White, Foreign	℔ ton $17.50@19.00
Barytes, Amer. floated	℔ ton 18.00@19.00
Barytes, Crude, No. 1	℔ ton 10.00@11.00
Chalk, in bulk	℔ ton 3.00@ 3.25
Chalk, in bbls	℔ 100 lb .. @ .35
China Clay, English	℔ ton 11.00@17.00
Cobalt, Oxide	℔ 100 lb 2.50@ 2.60
Whiting, Common	℔ 100 lb .43@ .48
Whiting, Gilders	℔ 100 lb .50@ .55
Whiting, Ex. Gilders	℔ 100 lb .55@ .60

Putty, Commercial—℔ 100 lb

In bladders	$1.65 @1.85
In bbls. or tubes	1.15 @1.35
In 1 lb to 5 lb cans	2.60 @2.90
In 12½ to 50 lb cans	1.45 @1.85

Spirits Turpentine—℔ gal.

In Oil bbls	71 @71½
In machine bbls	71½@72

Glue—

	℔ lb
Cabinet	11 @15
Common Bone	7 @ 9
Extra White	18 @21
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	℔ lb
Bleached Commercial	37 @38
Bone Dried	47 @48
Button	36 @45
Diamond I	@55
Fine Orange	45 @47
A. C. Garnet	@44
D. C	60 @..
Octagon B	@52
T. N	41 @43
V. S. O	58 @..

Colors in Oil—

	℔ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	10 @15
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil	9¼@ 9¾
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
In Barrels	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1½
Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	℔ lb
Lead, White, Dry in bbls	@ 6
Zinc, American, dry	4⅝@ 4¾
Zinc, French:	
Paris, Red Seal, dry	9¼
Paris, Green Seal, dry	10¾
Antwerp, Red Seal, dry	8¼
Antwerp, Green Seal, dry	9⅝
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	12¾@13
Lots of less than 1 ton	12¾@13¼
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11¼@11¾
Lots of less than 1 ton	11½@12

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb
Black, Carbon	5 @10
Black, Drop, American	4 @ 6
Black, Drop, English	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.50@3.60
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
Litharge, American, bbls	6 @ 6½
Ocher, American	℔ ton $8.50@16.00
Ocher, American Golden	2½@ 3½
Ocher, French	1¼@ 2½
Ocher, Foreign Golden	3 @ 4
Orange Mineral, English	8 @10
Orange Mineral, French	10¾@12¼
Orange, Mineral, German	8¼@10¼
Orange Mineral, American	8¼@ 8½
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	℔ 100 lb $0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital., Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Talc, French	℔ ton $15.00@30.00
Talc, American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb 90 @1.00
Terra Alba, English	℔ 100 lb 90 @1.00
Terra Alba, American, ℔ 100 lb., No. 1	.60 @70
Terra Alba, American, ℔ 100 lb., No. 2	.45 @50
Umber, Turkey, Bnt. & Pow	2½@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1½@ 2
Umber, Raw, Amer	1½@ 2
Yellow, Chrome	11 @14
Vermillion, American Lead	10 @25
Vermillion, Quicksilver, bulk	@65
Vermillion, Quicksilver, bags	@66
Vermillion, English, Import	75 @80
Vermillion, Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ₩ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....₩ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¼ ¢
Horseshoe brand, Wrought.....9@9¼ ¢
Trenton .....₩ lb 9@9¼ ¢

Imported—

Peter Wright & Sons.....₩ lb 10¼ ¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@75&5%
Jennings' Patn., reg. finish.....50&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....65%
Millers Falls.....50&5&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....30%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ₩ doz. $26; No. 2, $18.....65%
Ford's, Clark's Pattern.....40&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@$3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's .....33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts— See *Hafts, Awl.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality.....$6.75
Second Quality.....$6.25
Double Bit, base weights:
First Quality.....$9.00
Second Quality.....$8.50

Axle Grease—

See *Grease, Axle*

Axles— Iron or Steel

Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb.,1½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¢

Towel -

No. 10 Ideal, Nickel Plate..₩ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₩ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ₩ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..₩ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....₩ gro. $7.80
No. 2 Buffalo.....₩ gro. $9.80
No. 3 Perfection Dust.....₩ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned....₩ doz. $1.20
Holt, No. 1, Tinned.....₩ doz. $1.50
Holt, No. B, Japanned....₩ doz. $2.00
Holt, No. 2, Tinned.....₩ doz. $2.25
Lyon, No. 2, Japanned....₩ doz. $1.25
Lyon, No. 3, Japanned....₩ doz. $1.50
Taplin Mfg. Co.: ₩ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd. $8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd..$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ₩ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (S. S. & Co.).₩ gro. net, $6.00

Bellows—

Blacksmith, Standard List.. 60&10@70&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz...	*$4.75*	*5.70*	*6.65*	*7.60*	*8.85*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*
Doz...	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells— Cow—

Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.. 60&5@60&10%
White Metal.....60%
Nickel Plated....50&10@50&10&5%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....lb. 2¼ ¢
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting— Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....60%
Leather Lacing Sides, per sq. ft. 22¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden....70&10@75%
Hartz St. Tackle Blocks.....50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron.....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c...30&10@40&10%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅝ x 6 and smaller.75&5@75&10%
Larger and Longer...70@70&5%
Phila. Eagle,$3.00 list May 24,'99 80%
Bolt Ends, list Feb. 14, '95.... 70@70&5%
Machine, ⅝ x 4 and smaller 75&5@75&10%
Machine, larger and longer.. 70@70&5%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square.66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Plow and Stove—

Plow .....65&10&10@70%
Stove .....85@87½%

Tire—

Common .....80&10&5%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 23, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*	*2½*		
Per doz.....	*$6.65*	*11.50*		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—

Wrought Steel...80&10@80&10&5%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

	Quart.....	*10*	*12*	*14*
Water, Regular		*1.40*	*1.70*	*1.90*
Water, Heavy		*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom		*2.30*	*2.55*	*2.95*
Well		*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....₩ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, list Sept., '96....20&5%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5%
Parliament Butts.....70@70&5%

Wrought Steel—

Table and Back Flaps...75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts....55&10%

List, 10&10&5@10&10&10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series ....40&10%

Hendryx Bronze:
700, 800 series....40&10%
Hendryx Enameled....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb.4¢@4¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Gautier, Blunt....4@4¼¢
Gautier, Sharp....4½@4¾¢
Perkins', Blunt Toe....₱ lb 3.65¢
Perkins', Sharp Toe....₱ lb 4.15¢

Can Openers—

See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	120.00 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link: See Trade Report.
German Coil.....60&10&10@70%

Halter—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Covert Mfg. Co, Halter.....35&5%
Covert's Saddlery Works Halter.....70%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr. 6½—6-3, Str'ght, with ring .$23.50
6½—6-2, Str'ght, with ring .$24.50
6½—8-2, Str'ght, with ring .$28.00
6½—10-2, Str'ght, with ring.$32.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains.....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10&5@70%
Brass.....60&10@60&10&10%
Safety Chain.....75@75&10%
Gal. Pump Chain.....lb. 5@5¼%
Covert Mfg. Co.:
Breast.....35&5%
Heel.....35&5%
Rein.....35&5%
Stallion.....35&5%
Covert Sad. Works:
Breast.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Dog Leads and Kennel Chains.....40@40&5%
Niagara Dog Leads and Kennel Chains.....45@60&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Copper Chain.....60&5%
Steel Chain.....60%
Pullman:
Bronze Chain.....60%
Steel Chain.....60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 38@40¢
Carpenters' Red.....gro. 33@35¢
Carpenters' White....gro. 28@30¢
See also Crayons.

Checks, Door—

Bardsley's.....45%
Eclipse.....60&10%
Pullman, per gro.....$24.00
Russwin.....40%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....25%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—Socket Framing and Firmer

Standard List.....75@75&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60%
C. E. Jennings & Co. Socket Framing No. 15.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
L. & I. J. White.....30@30&5%

Chisels—Tanged—

Tanged Firmers..33 1-3@33 1-3&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White, Tanged.....25&5%

Chisels—Cold—

lb.
Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—

Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....50%
Universal.....50%
Combination.....50%
Drill Chucks, New Model.....30%
Drill Chucks, Standard.....45%
Drill Chuck, Skinner Pat., all sizes.35%
Drill Chucks, Positive Drive.....30%
Planer Chucks.....25%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....50%
Czar Drill.....35%
Combination Geared Scroll.....40%
Geared Scroll.....40%
Independent.....50%
Independent Steel.....40%
Union Drill.....45%
Universal.....50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co.....40&10@50%
Carriage Makers', Sargent's.....60%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see Vises, Saw Filers'.
Wood Workers, Hammers'.....40&10%

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓@35⅓&10%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75 } 15%
1902 Chicago Horse.....10.75 }
20th Century Horse, each, $5.00...20%
Lightning Belt.....$15.00 } 15%
Chicago Belt.....20.00 }
Stewart's Patent Sheep, $12.75....20%

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in..60&10@70%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....75@75&5%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%

Conductor Pipe,—

L. C. L. to Dealers: Galvanized.

Territory.	*Nested.*	*Not nested.*
Eastern	*70&15%*	*70&10%*
Central	*70&7½%*	*70&2½%*
Southern	*70&2½%*	*60&20%*
So. Western	*60&20%*	*60&10%*

Copper. *14&16 oz.*
Eastern.....50&10%
Central.....50&7½%
Southern.....50&5%
So. Western.....50&2½%
Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	5	6	8
Iceland, ea.	$1.80	$2.10	$2.40		$3.00
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15
White Enameled					25%
Agate Lined					25%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 20½@21½¢; lighter than 3 lbs. to pair.22½@23½¢

Cord—Sash—

lb.
Braided, Drab.....35¢
Braided, White, Com., Nos. 6 to 12.....23@24½¢
Cable Laid Italian.....
lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..17@19¢
Patent Russia.....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted.lb. 12@13¢
Anniston Cordage Co.: Braided Cotton. Old Glory, Nos. 7 to 12....₱ lb 29¢
Anniston, Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢; Anniston Drab, Nos. 7 to 12, ₱ lb, 26¢; Anniston Mahogany, 27¢.
Pearl Braided, cotton, No. 6, ₱ lb, 24½¢; No. 7, 23½¢; Nos. 8 to 12, 22¢
Eddystone Braided, Nos. 8, 9 and 10, 23¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Peerless:
Cable Laid Italian.....16 ¢
Cable Laid Russian.....14 ¢
Cable Laid India.....12 ¢
Braided India.....18 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz..10¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton.....₱ lb 40 ¢
Braided, Italian Hamp.....₱ lb 40 ¢
Braided, Linen.....₱ lb 55 ¢
Braided, White Cotton or Spot.....₱ lb 35 ¢
Massachusetts, White.....₱ lb 28 ¢
Massachusetts, Drab.....₱ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab.....40 ¢
A quality, White.....35 ¢
B quality, Drab.....35 ¢
B quality, White.....30 ¢
Italian Hemp.....40 ¢
Linen.....57½ ¢
See also Chain and Ribbon.

Wire, Picture—

List Oct., '00.....
85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, gr..6@6½¢
Cases, 100 gro., $5.00 at factory.
D. M. Steward Mfg. Co.: (Case lots, 2% 8%)
Jumbo Crayons.....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Zelnicker's Lumber:
Red, Blue, Green.....₱ gro. $6.50
Black.....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	1	2	3	4	11	5
Each	$5	$7	$10	$25	$50	$60

Enterprise.....25@25&7½%

Nos.	8	10	12	22	22
Each	$2	$3	$2.75	$4.50	$6

Dixon's.....₱ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40&10@50%
Little Giant.....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ₱ doz. $24.00...40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....₱ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 21 x 7, 25 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $4.80
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$25
Slaw Cutters, 2 Knife..₱ gr. $22@$30

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise.....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18.....40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's, Nos. 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers.....₱ doz. $6.25
Iwan's Perfection Post Hole Digger..₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers.....₱ doz. $7.25
Kohler's Universal.....₱ doz. $14.00
Kohler's Little Giant.....₱ doz. $12.00
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9.00
Kohler's Rival.....₱ doz. $8.00
Kohler's Pioneer.....₱ doz. $7.00
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ⅞ in....₱ doz. $10.00
Phillips', style 077, ⅞ in....₱ doz. $7.50
Phillips', style x-y, ⅞ in....₱ doz. $10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.... 60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in. $9.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50, 53 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles.....65%
No. 86.....75%
Victor.....55%
Defiance.....70%
Swan's:
Nos. 7565 to 7568.....50%
No. 7540.....40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
Eastern	*80&5%*
Central	*75&10&10%*
Southern	*75&12½%*
So. Western	*75&5%*

Terms,—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. C. Iron and Steel, Standard Gauge.....60&10%
No. 26.....35%
No. 24.....25%
No. 22.....10%
Copper.....37½%
Perfect Elbows (S., S. & Co.).....40%

Emery, Turkish—

	4 to 6	*5 to 180*	*Flour*
Kegs.....lb. 5 ¢	*5½ ¢*	*5½ ¢*	
½ Kegs.....lb. 5½ ¢	*5¾ ¢*	*5¾ ¢*	
¼ Kegs.....lb. 5½ ¢	*6 ¢*	*6 ¢*	
10-lb. cans, 10 in case....6½ ¢	*7 ¢*	*6 ¢*	
10-lb. cans, less than 10.....10 ¢	*10 ¢*	*8 ¢*	
Less quantity..10 ¢	*10 ¢*	*8 ¢*	

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's ..... 50&10%
Walling's ..... 40&10%

Cord and Weight—
Ives 40%

Faucets—
Cork Lined ..... *50@50&10%*
Metallic Key, Leather Lined .. *60&10@70%*
Red Cedar ..... *40&10@50%*
Petroleum ..... *70&10@75%*
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mtl. Key ..... 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
McKenna, Brass:
Burglar Proof, N. P. 25%
Improved, ¾ and ⅞ inch 25%
Self Measuring:
Enterprise, ℔ doz. $36.00 ..... 40&10%
Lane's, ℔ doz. $36.00 ..... 40&10%
National Measuring, ℔ doz. $36. 40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List revised Nov. 1, 1899.
Best Brands ..... *70&10@75&5%*
Standard Brands ..... *75&10@75&10&10%*
Lower Grade ..... *75&10&10@80&10%*

Imported—
Stubs' Tapers, Stubs' list, July 24, '97 ..... *33 1-3@40%*

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103 ..... $3.75
Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.15*	*2.85*	*3.25*	*3.75*	*4.50*

P., S. & W. Co. ..... 30&10@40%
Reading Hardware Co. 60%
Sargent's 70%
Stowell's Giant Grindstone Hanger .. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy ..... 50&10&10%
Stowell's Grindstone Fixtures, Light ..... 60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Header 66⅔%
Champion, Hay 66⅔%
Champion, Header 66⅔%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz. ..... *75@80¢*
Red, S'g't Bar, per doz. ..... *$1.00@1.25*
Red, Dbl. Brace, per doz. ..... *$1.40@1.50*

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped 3.65
Waterproof Dbl. Taped 4.40
Waterproof Tpl. Taped 5.15
} *10&2½%*

Gates, Molasses and Oil—
Stebbins' Pattern ..... *80&10@80&10&5%*

Gauges—
Marking, Mortise, &c. ..... *50&10&5@50&10&10&5%*
Chapin-Stephens Co.:
Marking, Mortise, &c. 50&10@50&10&10%
Scholl's Patent ..... 50&10@50&10&10%
Door Hangers ..... 50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge 35%
Marking and Mortise 60%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire, P. S. & W. Co. 33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.80
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.80; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co. ..... 60@60&10&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush .. *25@50%*
Cans (½ pts., pts., qts., ½ gal., gal.) ..... *25@40%*
International Glue Co. (Martin's) .. 40%

Grease, Axle—
Common Grade .... *gro. $4.50@6.00*
Dixon's Everlasting, 10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz.
1 lb, $1.20; 2 lb, $2.00
Helmet Hard Oil 25%

Grips, Nipple—
Perfect Nipple Grips ..... 40&10&2%

Griddles, Soapstone—
Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz. $2.00
Pike Mower and Tool Grinder, each $6.00
} 33⅓%
Velox Ball Bearing, Mounted, Angle Iron Frames, each $3.00

Halters and Ties—
Cow Ties ..... *60@60&10%*
Covert Mfg. Co.:
Web ..... 35&5%
Jute Rope 50%
Sisal Rope ..... 30&10%
Cotton Rope 45%
Hemp Rope 45%
Covert's Saddlery Works:
Web and Leather Halters 70%
Jute and Manila Rope Halters 70%
Sisal Rope Halters ..... 60&20%
Jute, Manila and Cotton Rope Ties 70%
Sisal Rope Ties ..... 60&10%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@60%
Niagara Coil and Halters .. 45@50&5%
Niagara Cow Ties .... 45&5@50&10&5%
E. T. Rugg & Co.:
Leather Halters 50%
Web Halters and Webbing 60%
Jute and Sisal Rope Halters 60%
Jute and Sisal Horse and Cattle Ties 60%
Cotton Horse Ties 60%
Livery Ties, Braided 60%

Hammers—
Handled Hammers—
Heller's Machinists' .. 40&10@40&10&10%
Heller's Farriers ..... 40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25 $1.50, $1.75 ..... 50%
Peck, Stow & Wilcox, Steel 50%
Fayette R. Plumb:
Plumb, A. E. Nail ..... 33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand ..... 50&7½&5@50&10&7½&5%
Machinists' Hammers .. 50&5@50&10&5%
Riveting and Tinners' ..... 40&2½@40&10&2½%
Sargent's C. S. New List 40%

Heavy Hammers and Sledges—
Under 3 lb., per lb. 50¢ ..... *80&10&10@85%*
3 to 5 lb., per lb. 40¢ ..... *80&10&10@85%*
Over 5 lb., per lb 30¢ .. *85@85&10%*
Wilkinson's Smiths' .. lb. *9½@10¢*

Handles—
Agricultural Tool Handles
Axe, Pick, &c .... *60&5@60&10&5%*
Hoe, Rake, &c ..... *45@50&5%*
Fork, Shovel, Spade, &c.:
Long Handles ..... *45@50&5%*
D Handles *40%*
Cross-Cut Saw Handles—
Atkins' 40%
Champion ..... 45@45&10%
Disston's 50%
Mechanics' Tool Handles—
Auger, assorted .. *gro. $2.50@2.85*
Brad Awl ..... *gro. $1.65@1.85*
Chisel Handles:
Apple Tanged Firmer, gro. assorted ..... *$2.40@2.65*
Hickory Tanged Firmer, gro. assorted ..... *$2.15@2.40*
Apple Socket Firmer, gro. assorted ..... *$1.75@1.95*
Hickory Socket Firmer, gro. assorted ..... *$1.45@1.60*
Hickory Socket Framing, gro. assorted ..... *$1.60@1.75*
File, assorted ..... *gro. $1.30@1.40*
Hammer, Hatchet, Axe, &c. 60&10@60&10&10%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished .. *65@75¢*
Plane Handles:
Jack, doz. 30¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool ..... 40@40&10%
Chisel ..... 65@65&10%
File and Awl ..... 65@65&10%
Saw and Plane ..... 40@40&10%
Screw Driver ..... 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle .... ℔ gro. $0.85@1.50

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.
Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Single Doz.	*$0.90*	*1.25*	*1.60*	*1.95*	*2.50*

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.	*$1.20*	*1.35*	*2.50*	*3.00*

Allith Mfg. Co.:
Reliable, No. 1 ..... per doz. $8.00
Reliable, No. 2 ..... per doz. $9.00
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&10%
Roller Bearing 70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 70%
Roller Bearing, No. 11, $15.00 .. 70%
Roller Bearing, Ex. Hy., No. 22, $18.00 ..... 70%
Hinged Hangers, $16.00 .... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing $4.00
Parlor, Standard $3.15
Parlor, No. 105 ..... $2.85
Parlor, New Model $2.80
Parlor, New Champion $2.25
Barn Door, Standard ..... 60&5%
Hinged ..... net $6.40
Covered ..... 60&2%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 60&10%
Cleveland 75%
Clipper, No. 75 ..... 60%
Crown ..... 60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant ..... 60&5%
Hummer ..... 70&5%
New York ..... 60&10%
Peerless 75%
Sterling ..... 60&10%
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers .... 60&5%
Richards Mfg. Co.:
Pioneer Wood Track No. 3 .. $2.00
Ball B'r'g St'l Track No. 10, 50&10%
Roller B'r'g St'l Track No. 12, $2.15
Roller B'r'g St'l Track No. 13, $2.30
Hero, Adj. Track No. 19 .. 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 .. 50&10%
Trolley B. D. No. 17 ..... $1.25
Trolley F. D. No. 120 ..... $2.10
Trolley F. D. No. 121 ..... $2.25
Trolley F. D. No. 150 ..... $2.35
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 44, 2½ and 3 60&10%
Palace, Adjustable Track No. 132 ..... 50&10%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.00
Trolley B. D. No. 20 ..... 50&10%
Trolley B. D. No. 24 ..... $1.30
Trolley B. D. No. 27 ..... $1.40
Trolley B. D. No. 28 ..... $1.60
Roller Bearings Nos. 39, 41, 43 ..... 75%
Anti-friction No. 42 ..... 60&20%
Hinged Tandem No. 48 .... 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Safety Door Hanger Co.:
Storm King Safety 60%
U. S. Standard Hinge 60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing 40%
Ajax Hinge Door 60%
Apex Parlor Door ..... 50&10&5%
Atlas 60%
Baggage Car Door 50%
Climax Anti-Friction ..... 50&10%
Elevator 40%
Express 50%
Freight Car Door 60%
Interstate ..... 60&10%
Lundy Parlor Door ..... 50&10%
Magic 60%
Matchless ..... 60&10%
Nansen ..... 70&5%
Parlor Door ..... 50&10%
Railroad ..... 50&10%
Rex Hinge Door 60%
Street Car Door 50%
Steel, Nos. 300, 404, 500 .... 50&10%
Underwriters' Fire Door 40%
Wild West Warehouse Door .. 50%
Zenith for Wood Track .... 50&10%
A. L. Sweet Iron Works:
Check Back 70%
Climax Anti-Friction ..... 50&10%
Eagle 70%
Hylo Hinge 60%
New Perfection 60%
Pilot 60%
Pilot Hinge 60%
Rider Wooster 65%
Western Pattern 70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing. 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing .. ℔ doz. $5.00
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing 50%
Dwarf Ball Bearing 40%
Ives, Wood Track ..... 60&10%
L. T. Roller Bearing .... 60&10&5%
New Era Roller Bearing .. 50&10%
O. K. Roller Bearing .. 60&10&5%
Prindle, Wood Track 60%
Richards' Wood Track 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing .... 60&10%
Tandem, Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing .. 40%
Velvet 50%
Wilcox Auditorium Ball B'r'g .. 20%
Wilcox Barn Trolley No. 123 .. 40%
Wilcox Elv. Door, Nos. 112 and 122½ 50%
Wilcox Elv. Door, No. 132 .... 40%
Wilcox Fire Trolley, Roller Bearing 30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century .. 50&10&10%
Wilcox O. K. Steel Track 50%
Wilcox O. K. Trolley 50%
Wilcox Trolley Ball Bearing .. 40%
Wilcox Wideman Narrow Gauge Ball Bearing 40%
} For Track, see Rail.

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.60; 4 pair Round Nickeled .. $27.00
Victor Folding ..... ℔ gro. $9.60
Western, W. G. Co. ..... 70&10%

Extra 10% often given.

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co. 30%

Hasps—
Griffin's Security Hasp 50%
McKinney's Perfect Hasp, ℔ doz. .. 50%

Hatchets—
Regular list, first quality *50%*
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 15%
Clark Coal, ℔ doz. $0.75 ..... 10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.75*	*.65*	*.60*	*.55*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Sargent's, Nos. 1, 3, 11 and 13 .. 75&10%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&10&5%
Acme, Lull & Porter ..... 75&10%
Queen City Reversible ..... 75&10%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5 .... 75&10&5%
Tip Pat'n, Nos. 1, 3 & 5 .. 75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75&10&5%
Shepard's Double Locking, Nos. 20 & 25 ..... 70%
Champion Gravity Locking, No. 75 .. 75%
Steamboat Gravity Locking, No. 10 .. 75%
Pioneer, Nos. 060, 45 & 5½ 75%
Empire, Nos. 101 & 103 ..... 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'f'es	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch ..... *doz.* ... *@$2.00*
Without Latch ... *doz.* ... *@$1.60*
Reversible Self-Closing:
With Latch ..... *doz.* ... *@$1.75*
Without Latch ... *doz.* ... *@$1.35*
Western:
With Latch ..... *doz. $1.75*
Without Latch ..... *doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—
Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 45%

Spring Hinges—
Holdback Cast Iron ..... } *See Trade Report.*
Non-Holdback, Cast Iron }
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 45%
Bardsley's Patent Checking .. 15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges 40%
Bommer Spring Hinges 40%
No. 999 Wrot, Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor Hinge 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, No. 14 ..... ℔ gr. $9.00
Columbia, No. 18 ..... ℔ gr. $25.00
Columbia, Adjustable, No. 7, ℔ gr. $12.00
Gem, new list 30%
Clover Leaf ..... ℔ gr. $12.00
Oxford, new list 30%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ℔ gr. $9.00
Ball Bearing Floor Hinge 50%
Ohio Detachable Screen Door Hinge ..... ℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4 ..... ℔ gr. $9.00
New Idea, No. 1 ..... ℔ gr. $9.00
New Idea, Double Acting 45%
New Idea, Floor 45%
Van Wagoner:
Ball Bearing 25%
No. 777 Sh't Steel Holdb'k. ℔ gro. pr. $9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges...70%
H'vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's.70&10%
Hinge Hasps.....50%
Cor. Heavy Strap..75&5%
Cor. Ex. Heavy T.70&10%
} Extra 10@10&5%

Screw and Strap. { *6 to 12 in..lb. 3½¢* / *1½ to 20 in..lb. 3¼¢* / *22 to 36 in..lb. 3 ¢*

Screw Hook and Eye:
⅜ to 1 inch.....lb. 6 ¢
⅝-inch.....lb. 7 ¢
½-inch.....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

	Per doz.
Inch	*15 16 17 18*
Galv. Open	*$2.50 2.75 3.00 3.25*
Jap. Open	*$1.90 2.10 2.25 2.55*
Galv. Funnel	*$3.00 3.30 3.60 3.90*
Jap. Funnel	*$2.45 2.65 2.85 3.30*

Masons' Etc.—

Avery-Caldwell Mfg. Co.:
Steel Brick.....each $1.00
Steel Mortar.....each $1.25
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....℔ doz., net, $4.36
W. & C. L'tning Shuffle Hoe, ℔ doz.$4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's.....45%
Empire.....50%
Pullman.....60%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List, Nos. 29, 32, 33, 129, 132, 133 and 135.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....75%
Czar.....65%
V Brace.....75%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $1.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree.....lb. 5⅝@6¢
Hooks and Eyes:
Brass.....60&10&5@60&10&10%
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Knobs—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 5 @ 6 ¢
3-ply Standard.....ft. 8 @ 9 ¢
4-ply Standard.....ft. 10 @11 ¢
3-ply extra.....ft. 11 @13 ¢
4-ply extra.....ft. 14 @16 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons— Sad—

From 4 to 10.....lb. 2¾@3 ¢
B. B. Sad Irons.....lb. 3¼@3½¢
Chinese Laundry.....lb. 4¾@5 ¢
Chinese Sad.....lb. 4 @4¼¢
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*62*	*59*	*72*	*69*
Tin'd Tops	*65*	*62*	*75*	*72*

New England Pressing..lb. 3¾@4¢

Pinking—

Pinking Irons.....doz. 50@60¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%
Steel.....45%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....75%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5&25%

Hay and Straw—

Serrated Edge..per doz. $5.25@5.50
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—

Buffalo.....℔ gro. $13.00

Miscellaneous—

Farriers'.....doz. $3.00@3.25
Westenholm's.....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip.....gro.$1.15@1.20
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather.*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 115.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz. $4.25@4.85
Lift Tubular, No. 0.....
doz. $4.50@5.15
Hinge Tubular, No. 0.....
doz. $4.50@5.15
Other Styles.....40&10@40&10&5%

Bull's Eye Police—

No. 1, 2¾-inch.....$2.50@2.75
No. 2, 3-inch.....$2.75@3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co., Cotton and Hemp.45%

Lifters, Transom—

R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.70*
75 feet	*$1.80*	*1.70*	*1.30*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $5.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ℔ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks— Cabinet—

Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.

Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....30%

Padlocks—

Wrought Iron...75&10&5@80&5%
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—

Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....55&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—

Reisinger Invincible Hand Power....
℔ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—

Chandler's.....12½%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$54.00
Champion Rotary Banner No. 1	$54.00
Standard Champion No. 1	$48.00
Standard Perfection	$36.00
Cinti Square Western	$30.00
Uneeda American, Round	$30.00

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.), new list..
50&10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest.....all sizes, $1.85@12.00
Cheap.....all sizes, $2.00@2.50
Better Grade..all sizes, $2.50@4.50

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M., S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899..85&10&10@90%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	*6*	*7*	*8*	*9*	*10*	
Anchor	*23*	*21*	*20*	*19*	*18*	*...40&5%*
Champions	*28*	*26*	*25*	*24*	*23*	*.....50%*
Coleman	*13*	*12*	*12*	*11*	*11*	*.....net*
New Haven	*23*	*21*	*20*	*19*	*18*	*...40&5*
Putnam	*23*	*21*	*20*	*19*	*18*	*....33⅓%*
New Putnam	*19*	*18*	*17*	*16*	*16*	*...10&10%*
Western						*℔ lb 8½¢*

Jobbers' Special Brands.....
per lb. 8½@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head	*.. 1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Mfrs. or U. S. Standard.
Square, Blank.....$5.00
Hexagon, Blank.....$5.50
Square, Blank, C. T. & R..$5.20
Hexagon, Blank, C. T. & R. 5.90
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....$5.50
Hexagon, Blank.....$5.90
Square, Tapped.....$5.40
Hexagon, Tapped.....$5.80

Oakum—

Best or Government.....lb. 6¢
U. S. Navy.....lb. 5¾¢
Navy.....lb. 4¾¢
Plumbers' Spun Oakum.....4¼¢
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10%
Tin or Steel.....65&10@70%
Zinc.....65&10@70%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13.....20%
Malleable, Hammers' Old Pattern, Nos. 1, 2 and 3.....50%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can—

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....$1.75@$3.00
National.....50&10%
Stowell's Sprague.....℔ doz. 35@45¢
Vim Tin Shear and Can Opener, ℔ doz., 75c.; per gro., $7.50

Egg—

Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope.....lb. 14@16¢

Rubber—

(Fair quality goods.)
Sheet, C. I.....8@10¢
Sheet, C. O. S.....9@13¢
Sheet, C. B. S.....10@14¢
Sheet, Pure Gum.....50@65¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

	1	*2*	*3*	*4*	*5*
Nos.					
Per doz	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co., ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos: *lb.*
lb.....6¢
Building Felt, 8, 10 and 12 Mill Board, sheet, 40x40 in., 1-32 to ⅛ in.....10¢
Roll Board, 1-16 in. and under.....6¢
Roll Board, 3-32 and ⅛ in..8¢
} 33 1/3%

Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll 35@40¢
Medium weight, 30 lbs. to roll, 40@45¢
Heavy weight, 40 lbs. to roll.. 50@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$38.00@40.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 500 sq. ft.), ton....
$32.50@35.50
2 ply, roll 108 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....78@85¢

Slater's Felt (roll 500 sq. ft.) .75¢
R. M. Stone Surfaced Roofing (roll 110 sq. ft.)....$2.75

Sand and Emery—

Flint Paper and Cloth .60@60&10%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h .50&10@60%

Parers— Apple—

Advance ....₱ doz. $4.00
Baldwin ....₱ doz. $4.00
Bonanza Improved....each $6.50
Daisy ....₱ doz. $4.00
Dandy ....each $7.50
Eureka Improved....each $20.00
Family Bay State....₱ doz. $15.00
Improved Bay State....₱ doz. $36.00
Little Star....₱ doz. $5.00
New Lightning....₱ doz. $7.00
Reading 72....₱ doz. $3.25
Reading 78....₱ doz. $6.25
Rocking Table....₱ doz. $6.20
Turn Table '98....₱ doz. $6.00
White Mountain....₱ doz. $5.00

Potato—

Saratoga ....₱ doz. $7.00
White Mountain....₱ doz. $6.00

Picks and Mattocks—

List Feb. 23, 1899.....75@75&5%
Cronk's Handled Garden Mattock, ₱ doz., $6.40....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass ....60@60&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in....60%
Extra Heavy, 2-6 in....70%
Fittings 75%

Pipe, Merchant—

Consumers, Carloads.

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
⅛ & ¼ in.	71%	55%	68½%	52½%
⅜ & ½ in.	75%	63%	72½%	60½%
¾ to 6 in.	79%	69%	77 %	67 %
7 to 12 in.	74%	59%	72 %	56½%

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England....68%
New York and New Jersey.71%
Maryland, Delaware, E. Pa.75%
West. Pa. and West Va....77%
Virginia 76%
Ohio, Michigan and Ky....77%
Indiana 77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual....40&10%
Bench, Second qual....50&10%
Molding ....33⅓&10%
Bailey's (Stanley R. & L. Co.)....40%
Chapin-Stephens Co.:
Bench, First Quality....40@40&10%
Bench, Second Quality....50@50&10%
Molding ....33⅓@33⅓&10%
Toy and German....40@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality....40@40&10%
Bench, Second Quality....50@50&10%
Molding ....33⅓@33⅓&10%
Adjustable Wood Bottom....60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.)....40%
Chaplin's Iron Planes....50&10%
Miscellaneous Planes (Stanley R. & L. Co.)....35%
Ohio Tool Co.'s Iron Planes....60
Sargent's ....40&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons....25&10@30%
Buck Bros....30%
Chapin-Stephens Co....30@30&10%
Ohio Tool Co....30%
Stanley R. & L. Co....35%
Union 50%
L. & I. J. White....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse....₱ doz. $8.50

Plates—

Felloe ....lb. 3¾@4¼¢
Self-Sealing Pie Plates (S., S. & Co.). ₱ doz. $2.90....50%

Pliers and Nippers—

Button Pliers....75&10@80%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers....50&5%
Cronk & Carrier Mfg. Co.:
American Button....75&10%
Cronk's....60%
Stub's Pattern....50%
Combination and others....33⅓%
Heller's Farriers' Nippers, Pincers and Tools....40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers....50%
P., S. & W. Tinners' Cutting Nippers....40%
Swedish Side, End and Diagonal Cutting Pliers....50%
Utica Drop Forge & Tool Co.: Pliers and Nippers, all kinds....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels....30@30&10&10%
Chapin's Imp. Brass Cor.40@40&10&10%
Pocket Levels....30@30&10&10%
Disston's Plumbs and Levels....70%
Disston's Pocket Levels....70%
C. E. Jennings & Co.'s Iron....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable ....40&7½%
Stanley R. & L. Co....45%
Stanley's Duplex....35%
Woods' Extension....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00....50%

Points, Glaziers'—

Bulk and 1-lb. papers, lb. 8½@9 ¢
½-lb. papers....lb. 9 @9½¢
¼-lb. papers....lb. 9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye....₱ doz. $3.25
Ft. Madison Western....₱ doz. $4.00

Police Goods—

Manufacturers' Lists..25@25&5%
Tower's 25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ₱ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ₱ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ₱ doz., $3.00; No. 2 (1 qu.), $9.72....40%
Prestoline Paste....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gro. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz., $1.25; ₱ gro., $12.00.
Barkeepers' Friend Metal Polish, ₱ doz., $1.75; ₱ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins....$6.75
Joseph Dixon's, ₱ gr. $5.75....10%
Dixon's Plumbago....₱ lb 8¢
Fireside ....₱ gr. $2.50
Gem, ₱ gr, $4.50....10%
Japanese ....₱ gr. $3.50
Jet Black....₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail....each 70¢
Black Silk, ½ lb box....₱ doz. $1.00
Black Silk, 5 oz. box....₱ doz. $0.75
Black Silk, ½ pt. liq....₱ doz. $1.00

Poppers, Corn—

1 qt., Square....gro. $9.00
1 qt., Round....gro. $10.00
1½ qt., Square....gro. $11.00
2 qt., Square....gro. $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb....each 15¢
Rifle, 1-lb....each 25¢
In Kegs:
12½-lb. kegs....$3.50
25-lb. kegs....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk)....$6.50
Half Keg (12½ lb bulk)....$3.50
Quarter Keg (6¼ lb bulk)....$1.90
Case 24 (1 lb cans bulk)....$8.50
Half case (1 lb cans bulk)....$4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk)....$12.00 $15.00
Half Keg (12½ lb bulk).... 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk).. 7.25 8.75
Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co....20@25%

Seal Presses—

Morrill's No. 1, ₱ doz., $20.00....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller....$21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ₱ doz., $12.00.... 33⅓&10%
Morrill's No. 1, Nail Puller, ₱ doz. $20.00 ....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00....50%
Pelican, ₱ doz. $9.00....40&10%
Scranton, Case Lots:
No. 2B (large)....$5.50
No. 3B (small)....$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots.... ₱ doz. $6.00
Diamond B, No. 3, case lots.... ₱ doz. $5.50
Giant No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15....33⅓%
Staple Pullers....60%
Parrot Tack and Stub Puller, ₱ doz., 75c.; ₱ gro., $6.00

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.30*	*.45*	*.60*	*1.05*

Hay Fork, Swivel or Solid Eye. doz., 4 in., $1.25; 5 in., $1.55

Inch	2	2½	2¾
Hot House, doz.	$0.65	.85	1.20
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.80
Inch	1½	1¾	2	2½

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light....60%
Side, Anti-Friction....60&13%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in....16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢
Acme....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ₱ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal ....70&10%
Niagara....1¾ in. 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern ....60@60&10%
Pitcher Spout....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list)....50%
Barnes' Pitcher Spout....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co....$16.00
Daisy Spray Pump....₱ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list)....55%
Flint & Walling's Fast Mail (low list) ....55&5%
Flint & Walling's Tight Top Pitcher..80%
National Specialty Mfg. Co., Measuring, $6.00....30%
Mechanical Sprayer....$6.00
Myers' Pumps (low list)....50%
Myers' Power Pumps....50%
Myers' Spray Pumps....50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	3	3¼	3½	3¾	4
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	*3.85*	*5.00*	*6.00*

Punches—

Saddlers' or Drive, good.... doz. 50@75¢
Spring, single tube, good quality....$1.75@2.00
Revolving (4 tubes).... doz. $3.50@3.75
Beimis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 ....50%
Hercules, 1 die, each $5.00....50%
Niagara Hollow Punches....40%
Niagara Solid Punches....55&10%
Steel Screw, B. & K. Mfg. Co....50%
Tinners' Hollow, P., S. & W. Co....40%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44....60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ in.	
$2.50	*$3.00*	*$4.40*	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$2.00	*$2.70*	*$3.60*	*100 feet.*

Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢....30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ₱ ft. 5½¢
No. 2, Reliable Hgr. Track, ₱ ft. 7¢
Cronk's:
Double Braced Steel Rail..₱ ft. 2¾¢
O. N. T. Rail....2¾¢
Griffin's:
xxx, ₱ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ₱ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T. ₱ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in....₱ 100 ft. $4.00
Lawrence Bros.:
₱ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ₱ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ₱ ft., 11¢..50%
None Better....₱ ft. 3¾¢
Standard ....₱ ft. 4 ¢
Myers' Stayon Track....60&10%
Richards' Mfg. Co.:
Common 1 x 3-6 in., $2.25; 1¼ x 3-16, $2.50; 1¼ x 3-16, $2.75.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65....50%
Gauge Trolley Track, ₱ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 29¢.
Safety Door Hanger Co.'s Storm King Safety....60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail....₱ ft. 1¾¢
Steel Rail, Plain....25%
Wrought Bracket, 1 3-16 in....₱ ft. 3¢
Wrought Bracket, 1½ x 5-16..₱ ft. 7¢
Swett's Hylo, ₱ ft. 11¢....60%
P. L. B. Steel Rail....₱ 100 ft. $3.00
No. 0, 1 x 3-16....₱ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ₱ doz., net....$4.25
Cronk's:
New Champion Garden, ₱ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00...75%
Victor Garden, ₱ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00....80%
Queen City Lawn, ₱ doz., 29 teeth, $3.45; 24, $3.60....net.
Anticlog Lawn, ₱ doz....$4.00
Malleable Garden....70&10%
Kohler's:
Lawn Queen, 20-tooth....₱ doz. $3.45
Lawn Queen, 24-tooth....₱ doz. $3.60
Paragon, 20-tooth....₱ doz. $2.75
Paragon, 24-tooth....₱ doz. $3.00
Steel Garden, 14-tooth....₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $1.75@2.00
Weldless Steel Garden....75&5%

Rasps, Horse—

Disston's 75%
Heller Bros.'....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson....70&10@75%
See also Files.

Razors—

Boras—I C....60%
Fox Razors, No. 42...₱ doz. $20.00
Fox Razors, No. 44...₱ doz. $20.00
Fox Razors, No. 82, Platina... ₱ doz. $25.00
} 40%
Red Devil....50%
Silberstein:
Carbo Magnetic....$18.00
Griffon, No. 65....$15.00
Griffon, No. 99....$12.00
All other Razors....40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¾, M 16, Q 16, A 16, B 16, 1008, Rubber, Populo, Nickeled Populo....20%
Aluminum, German silv., Bronze.25%
1240 N, 124 N....20%
3004 N, 06 N, 6 RM, G 9....25%
4 N, 6 PN, 24 N, 26 PN....20%
2904 P....33⅓%
2904 PN....33⅓%
0924 N....33⅓%
02084 N....33⅓%
002904 PN....33⅓%
802 N....33⅓%
986 PN, 2904 N, 974 PN....25%
5009 PN, 5009 N....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR....20%
304 P, 304 PN, 00304 P, 00304 PN..33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed ....70&10%
Bronzed 75%

Revolvers—

Single Action....95¢@$1.00
Double Action, except 44 cal. $1.85
Double Action, 44 caliber....$2.00
Automatic $3.45
Hammerless $4.00
Thayer Robertson & Cary:
Automatic....each $2.75
Hammerless....each $3.25

Riddles, Hardware Grade

16 in....per doz. $2.25@$2.50
17 in....per doz. $2.50@$2.75
18 in....per doz. $2.75@$3.00

Rings and Ringers—

Bull Rings—

	2	2½	3 inch.
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.00*	*1.15*	*1.40 doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ₱ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes..$4.00@4.50
Hill's Ringers, Gray Iron.... doz. 50@55¢
Hill's Ringers, Malleable Iron... doz. 70@75¢
Blair's Rings...per gro. $4.75@5.25
Blair's Ringers..per doz. $0.60@ .65
Brown's Rings..per gro. $5.00@5.50
Brown's Ringers.per doz. $0.60@ .65

Rivets and Burrs—

Copper ....50&10@50&10&5%
Iron or Steel....75@75&5%

Rollers—

Acme, Stowell's Anti-Friction....50%
Barn Door, Sargent's list....60%
Cronk's Stay No. 65, $0.90; No. 50 ....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56....$0.84
Lane's Stay....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57....50%
Underwriters', Nos. 59, 60....50%
Favorite, No. 54....60%
Stowell's Barn Door Stay..₱ doz. $1.00
Swett's Anti-Friction....50%
Screw and Spike Stay....₱ doz. 65¢
Hinge Adjustable Stay....₱ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger: Pure....lb., 11¾@12¢
Sisal, 7-16 in. diam. and larger: Pure....lb., 10¢
Sisal, 7-16 in. diam. and larger: No. 2 quality....lb., 8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed....lb., 8¢
Pure....lb., 9¢
Sisal, Tarred, Medium Lath Yarn: Mixed....lb. 7½¢
Pure....lb. 8½¢
Cotton Rope, on reels: Lb.
Best, ¼-in. and larger. 16½@18¢
Medium, ¼-in. and larger. 15½@16½¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope:
Thread No. 1, ¼-in. & up. lb. 6¼¢
Thread No. 2, ¼-in. & up, lb. 5¾¢
Old Colony Manila Transmission Rope ....₱ lb 17½¢

Wire Rope—

Galvanized ....37½&2½%
Plain ....15&2½%

Ropes, Hammocks—
Covert Mfg. Co.:
Jute 50%
Sisal ..... 30&10%
Covert Saddlery Works ..... 60&5%

Rulers, Desk—
Stimpson & Son:
Boxwood and Maple ..... 30&10%

Rules—
Boxwood ..... 60&10&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Flexifold ..... 27½&10&10&2½%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag 40%
Zig Zag, Pin Joint 42½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band ..... 50&10@60%
Cross Cuts ..... 35&5%
Mulay, Mill and Drag 50%
One-Man Saw 40%
Wood Saws 40%
Hand, Compass, &c 40%
Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 14 in. wide 60%
Band, ¾ to 1¾ 60%
Crosscuts 50%
Narrow Crosscuts 55%
Mulay, Mill and Drag 50%
Framed Woodsaws 35%
Woodsaw Blades 35%
Woodsaw Rods 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, 108, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Butcher Saws and Blades 35%
C. E. Jennings & Co.'s:
Back Saws 25%
Butcher Saws 30%
Compass and Key Hole Saws ..... 35&5%
Framed Wood Saws 30%
Hand Saws ..... 20&2½%
Wood Saw Blades 35%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 50%
Crescent Ground Cross Cut Saws 35%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 50%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c ..... 25@25&7½%
Wood Saws ..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws ..... 40&10@50%
Butcher Saws Blades ..... 35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saws—
Atkins' Hack Saw Blades A A A A 25%
Disston's:
Concave Blades 25%
Keystone 40%
Hack Saw Frames 30%
Fitchburg File Works, The Best 35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, ... 40&7½%
Goodell's Hack Saw Blades 40%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades 35%
Diamond Hack Saw Frames 50%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 25%
Victor Hack Saw Frames 40%

Scroll—
Barnes' No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $4.00 ..... 15&10%

Scalers, Fish—
Covert's Saddlery Works ..... 60&10%

Scales—
Family, Turnbull's ..... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz. $16.00
Union Platform, Plain $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
Chicago Scale Co.:
The "Little Detective" ..... 25 lbs 50%
Union or Family No. 2 ..... 60%
Portable Platform (reduced list) 50%
Wagon or Stock (reduced list) ..... 25@35%
"The Standard" Portables 50%
"The Standard" R. R. and Wagon 50%

Scrapers—
Box, 1 Handle ..... doz. $2.00@2.25
Box, 2 Handle ..... doz. $2.60@2.85
Ship ... Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00 ..... 45%
Chapin-Stephens Co., Box ..... 30@30&10&10%

Screens, Window and Frames—
Air Line Pattern Screens ..... 60&10%
Flyer Pattern Screens ..... 60&10@60&10&5%
Maine Screen Frames ..... 40&10&5%
Perfection Screens ..... 60&10@60&10&5%
Phillips' Screen Frames ..... 60&5@60&10%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, dos., 1 in., $2.50@2.75; 1½, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech, doz. 30@30&5%
Hand, Wood ..... 30@30&5%
R. Bliss Mfg. Co., Hand ..... 30@30&10%
Chapin-Stephens Co., Hand ..... 30@30&10%
Ohio Tool Co., Bench and Hand 30%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 ..... 75&17½&10%
Coach, Gimlet Point, list Oct. 1, '99 ..... 75&12½&10%
Hand Rail, list Jan. 1, '81 .... 70&10@75%

Jack Screws—
Standard List ..... 80@80&5%
Millers Falls ..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P., S. & W 50%
Sargent ..... 70&10%
Swett Iron Works ..... 75&10@80&5%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron .... 50@50&10%
Flat or Round Head, Brass .... 50@50&10%

Set and Cap—
Set (Iron) 80%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap 75%
Hex. Hd. Cap 75%
Rd. Hd. Cap ..... 60&10%
Fillister Hd. Cap ..... 60&10&10%

Wood—
List July 23, 1903.
Flat Head, Iron ..... 87½&10@.. %
Round Head, Iron ... 85 &10@.. %
Flat Head, Brass ... 85 &10@.. %
Round Head, Brass .. 80 &10@.. %
Flat Head, Bronze ... 77½&10@.. %
Round Head, Bronze .75 &10@.. %
Drive Screws ..... 87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
Per doz.
Grass, No. 1, Plain Finish ... $6.25
Clipper, Bronzed Webb ... $6.50
No. 3 Clipper, Polished Webb, $6.75
No. 6 Clipper and Solid Steel, $7.00
Bush, Weed and Bramble, No. 2, $6.50
Grain, No. 1 ..... $8.25
Bronzed Webb, No. 1 ..... $8.50
Nos. 3 and 4 Clipper, Grain, $8.75
Solid Steel No. 6 ..... $9.25
Grain $8.25
Clipper, Grain $8.50
Weed and Bush $6.50

Seeders, Raisin—
Enterprise ..... 25@30%

Sets—Awl and Tool—
Aiken's Sets, Awl and Tools:
No. 20, ℔ doz., $10.00 ..... 60&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ... 15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00

Sets, Nail—
Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Cannon's Diamond Point, ℔ gro. $12.40%
Mayhew's ..... ℔ gro. $9.00
Snell's Corrugated, Cup Pt. ... ℔ gro. $7.20
Snell's Knurled, Cup Pt. ... ℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—
Regular list ..... 75@75&10%

Saw—
Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut 30%
Plate 20%
Disston's Star and Monarch 25%
Morrill's No. 1, $15.00 ..... 50%
Nos. 3 and 4, Cross Cut, $20.00 ... 50%
No. 5, Mill, $30.00 ..... 50%
Nos. 10, 11, 95, $15.60 ..... 50%
No. 1 Old Style, $10.00 ..... 50%
Special, $16.25 ..... 50%
Giant Royal Cross Cut ... ℔ doz. $8.00
Royal, Hand ..... ℔ doz. $4.50
Taintor Positive ..... ℔ doz. $6.75

Shaving
Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s 60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co. 70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz. $1.50
Mounted Kitchen Sand Stone, ℔ doz. $1.50
Natural Grit Carving Knife Hones, ℔ doz. $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz. $1.50
Quick Edge Pocket Knife Hones, ℔ doz. $2.50
} net

Skate—
Smith & Hemenway Co. 20%

Shaves, Spoke—
Iron ..... doz. $1.10@1.25
Wood ..... doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.) 45%
Razor Edge (Stanley R. & L. Co.) .. 35%
Chapin-Stephens Co. ..... 30@30&10&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%
Wood's F1 and F2 ..... 50%

Shears—
Cast Iron .. 7 8 9 in.*
Best ... $16.00 18.00 20.00 gro.
Good ... $13.00 15.00 17.00 gro.
Cheap .. $5.00 6.00 7.00 gro.
Straight Trimmers, &c.:
Best quality Jap ... 70@70&10%
Best quality, Nickel .. 60@60&10%
Fair quality, Jap ... 80@80&5%
Fair quality, Nickel .. 75@7"&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson's Sheep, 1900 list ..... 50&10%

Tinners' Snips—
Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in. 50%
Niagara Snips 40%
P., S. & W. Forged Handles 20%

Pruning Shears—
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades ..... 50&10%
P. S. & W. Co. 33⅓%
Wilkinson's Hedge, 1900 list ..... 50&10%
Wilkinson's Lawn and Border 50%

Sheaves—Sliding Door—
Stowell's Anti-Friction 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 40%
R. & E. list 33⅓%
Wrightsville Hatfield Pattern 80%

Sliding Shutter—
Reading list 40%
R. & E. list 33⅓%
Sargent's list ..... 10&10%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge ..... 65&10%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge. 25&10%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge ..... 20&5%
Climax, Union, League, New Rival, 10 and 12 gauge ..... 25&5%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ..... 20&5%
Expert, Metal Lined and Pigeon, 10 12, 16 and 20 gauge ..... 33⅓&5%
Robin Hood, Low Brass ..... 20&10%
Robin Hood, High Brass ..... 30&10%

Shells, Loaded—
Loaded with Black Powder .. 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass 50%
Comets, High Brass ..... 50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... per keg $4.00
Steel ..... per keg $3.75
Burden's, all sizes ..... ℔ keg $3.90

Shot—
Drop, up to B, 25-lb. bag $1.70
Drop, B and larger ..... per 25-lb. bag, $1.95
Buck, 25-lb. bag $1.95
Chilled, 25-lb. bag $1.95

Shovels and Spades—
Association List, Nov. 15, 1902. 40%

Sieves and Sifters—
Hunter's Imitation ..... gro. $10.50@11.00
Hunter's Genuine ..... per gro. $12.00@12.50

Buffalo Metallic Blued, S. S. Co., ℔ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ℔ doz.. $2.00 ..... 20%

Sieves, Seamless Metallic
Per dozen.

	14	16	18	20
Mesh 14				
Iron Wire ... $1.05	*1.05*	*1.10*	*1.20*	
Tinned Wire .. $1.15	*1.15*	*1.20*	*1.30*	

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ... doz. $0.90@0.95
Mesh 20, Nested ... doz. $1.00@1.05
Mesh 24, Nested ... doz. $1.30@1.40

Sinks, Cast Iron—
Standard list ..... 60@60&10%
Barnes' low list ..... 60&5%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron ..... 80@80&10%
Steel ..... 40@40&10%

Slates, School—
Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless .. 60&5 tens
Victor A, Noiseless ..... 60&½ tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... 40@40&10%
Covert Mfg. Co.:
Derby ..... 30&2%
High Grade 40
Jockey 35%
Trojan 45
Yankee ..... 30&2%
Yankee Roller ..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Harness Snaps, 1 inch ..... 60&5%
Swivel Snaps 60%
Swivels 50%
Sargent's Patent Guarded ... 66⅔&10%

Snaths—
Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous—
German Silver ..... 60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver 50%

Tinned Iron—
Teas ..... per gro. 45@50¢
Tables ..... per gro. $0.50@$1.00

Springs—Door—
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 25%
Reliance (Coil) ..... 40&10%
Star (Coil) 30%
Torrey's Rod, 30 in. ..... ℔ doz. $1.10
Victor (Coil) ..... 50&10&10%

Carriage, Wagon, &c.—
1¼ in. and Wider: Per lb
Black ..... 4@4¼¢
Half Bright ..... 4@4¼¢
Bright ..... 4½@4¾¢
Painted Seat Springs:
1½ x 2 x 26 ..... per pr. 42¢
1½ x 3 x 28 ..... per pr. 70¢

Sprinklers, Lawn—
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24 ..... 30%
Pleuger & Henger Mfg. Co.:
Cactus 70%
Japanese 75%
Nationals 65%

Squares—
Nickel plated .. } List Jan. 5, 1900.
Steel and Iron . } 75&5@75&10%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Sq. and T-Bevels 70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2 ..... 50%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.25
Iron, Porcelain Lined ... doz. $1.75

Staples—
Barbed Blind ..... lb. 6@6½¢
Electricians', Association list .. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples ..... per lb. 3½@3½¢
Grand Crossing Tack Co.'s list .. 80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros. 30%
C. & A. Hoffmann's 10%

Steelyards—.... 30@30&10%

Stocks and Dies—
Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock .. 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—
Enterprise ..... 25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit. 60%
Gem Corundum Axe, Single or Double Grit 60%
Gem Corundum Slips 60%
Gem Corundum Razor Hones 50%
Pike Mfg. Co., 1904 list: ℔ lb.
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 30¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢

India Oil Stones (centre list)....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%
Hindostan No. 1, R'g'lar, ₱ lb 8¢
Hindostan No. 1, Small..₱ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, Extra, 5 to 8 in.....₱ lb 80¢
Queer Creek Stones, 4 to 8 in..20¢
Queer Creek Slips.....40¢
Sand Stone.....6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ₱ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots.....₱ gro. $9.00
One gross or more.....₱ gro. $7.20
Lots of 10 gross or more..₱ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S..₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S.₱ gro. $9.00
Green Mountain S. S..₱ gro. $6.00
Extra Indian Pond S.S.₱ gro. $7.50
No. 1 Indian Pond S.S.₱ gro. $7.00
No. 2 Indian Pond S.S.₱ gro. $4.50
Leader Red End S. S.₱ gro. $4.50
Quick Cut Emery.....₱ gro. $10.00
Pure Corundum,.....₱ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
} 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots..20&10&10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .....doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902 .....50&5%

Sweepers, Carpet—

National Sweeper Co.: ₱ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled $24.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in. case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $3 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire.....₱ doz $25.00
Model A, Sterling.....₱ doz. $25.00
Model B, Sterling, Nickeled.....₱ doz. $23.00
Model B, Sterling, Japanned.....₱ doz. $21.00
Model C, Sterling.....₱ doz. $21.50
Model D, Sterling.....₱ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks .90&37½%
American Cut Tacks....90&37½%
Swedes Cut Tacks.....90&37½%
Swedes Upholsterers' Tacks... 90&50%
Gimp Tacks.....90&50%
Lace Tacks.....90&50%
Trimmers' Tacks.....90&37½%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&50%
Hungarian Nails.....85%
Finishing Nails.....70%
Trunk and Clout Nails....80&5%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list .....50&10@60%
See also Nails, Wire.

Tanks, Oil— Each.

Emerald, S., S. & Co.....30-gal. $3.40
Emerald, S., S. & Co.....50-gal. $4.25
Queen City, S., S. & Co....30-gal. $3.65
Queen City, S. S. & Co....50-gal. $4.50

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel .....33 1-3&5%
Chesterman's .....25@25&5%
Eddy Asses' Skin.....40&10@50%
Eddy Patent Leather.....25@30&5%
Eddy Steel.....40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list..... 35@35&5%
Pocket .....35@35&5%
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&8½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers.....50%
Stowell's Hay Forks.....50%
Stowell's Fork Pulleys.....50%

Miniature—

Smith & Hemenway Co.'s.....25%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.50; gro. $13.00@13.50

Game—

Oneida Pattern...75&10@75&10&5%
Newhouse .....45@45&5%
Hawley & Norton.....65%
Victor .....70&10%
Oneida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ₱ doz. $13.25
No. 2, Rat, ₱ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ₱ doz. $5.25; case of 72 ₱ gro. $4.70 doz.
No. 4, Mouse, ₱ doz. $3.65; case of 150 $3.00 doz.
No. 5, Mouse, ₱ doz. $3.00; case of 180 $2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, 5 in. ₱ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ₱ gro. $6.00
Never-Break Steel Garden Trowels.. ₱ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....₱ doz. $16.00
Grocery .....₱ doz. $15.00
Daisy Stove Trucks, Improved Pattern .....₱ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....₱ doz. $18.50

Tubs, Wash—

No.	*1*	*2*	*3*
Galvanized, per doz.	*$4.25*	*4.75*	*5.25*

Galvanized Wash Tubs (S., S. & Co.):

No.	1	2	3	10	20	30
Per doz., net.	$5.70	6.30	7.20	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls	*.22@24¢*	
No. 12, ¼ and ½-lb. Balls	*.18@20¢*	
No. 18, ¼ and ½-lb. Balls	*.16@18¢*	
No. 24, ¼ and ½-lb. Balls	*.16@18¢*	
No. 36, ¼ and ½-lb. Balls	*.15@17¢*	
Chalk Line, Cotton ½-lb. Balls	*.25@30¢*	
Cotton Mops, 6, 9, 12 and 15 lb. to doz	*.10@18¢*	
Cotton Wrapping, 5 Balls to lb., acording to quality...	*11½@20¢*	
American 2-Ply Hemp, ¼ and ½-lb. Balls	*.13@14½¢*	
American 3-Ply Hemp, 1-lb. Balls	*.13@14½¢*	
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)	*.....*	*8½¢*
India 3-Ply Hemp, 1-lb. Balls	*.....*	*8½¢*
India 3-Ply Hemp, 1½-lb. Balls	*.....*	*7@8¢*
2, 3, 4 and 5-Ply Jute, ½-lb. Balls	*.....*	*9@10¢*
Mason Line, Linen, ½-lb. Bls	*.....*	*4¢*
No. 2½ Mattress, ¼ and ½-lb. Balls	*.....*	*37¢*
Wool, 3 to 6 ply....B 5½¢; A 6¢		

Vises—

Solid Box.....60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting.....25@25&5%
Tiger Machinists'.....40%
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&5@70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch 50%
Solid Jaw.....50%
Merrill's 20%
Millers Falls.....60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip.....20%
Parker's:
Victor .....20@25%
Regulars .....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Sargent's 40%
Snediker's X. L.....33⅓%
Stephens' 33⅓%
Williamson Mfg Co, Double Swivel.. 40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz. $30.....25%
Perfection Saw Clamps, ₱ doz....$4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip.....15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise .....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%
Williamson Mfg. Co, Double Swivel Combination Pipe.....40&5%

Wads—*Price per M.*

B. E., 11 up	*.60¢*	
B. E., 9 and 10	*.70¢*	
B. E., 8	*.80¢*	
B. E., 7	*.80¢*	
P. E., 11 up	*.$1.00*	
P. E., 9 and 10	*1.25*	
P. E., 8	*1.50*	
P. E., 7	*1.50*	
Ely's B. E., 11 and larger	*.$1.70@1.75*	
Ely's P. E., 12 to 20	*...$3.00@3.25*	

Dis. 15%

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 55%
Ground 60%
Plain or Unground.....65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware:
Maslin Kettles.....70%
Covered Wares
Tinned and Turned.....40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅞ 1 1¼ 1¼ Inch.
10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ...$5.20 4.30 3.00 2.80 2.60
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 .....50&10%

Wedges—

Oil Finish.....lb. 2.15@2.30¢

Weights—Hitching—

Covert Mfg. Co.....40&2%
Covert's Saddlery Works.....60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District...$27.50@$28.00
Southern Territory.$20.00@$23.00
Western and Central Districts .....$23.00@$25.00

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80&5@80&7½%
10 to 18.....80@80&5%
19 to 26.....80&10@80&10&5%
27 to 36.....80&5@80&10%
Galvanized:
6 to 9.....77½@77½&5%
10 to 14.....72½@72½&5%
15 to 16.....75&7½@75&10&2½%
19 to 26.....75&5@75&10%
27 to 36.....72½&5@72&7½%
Coppered:
6 to 9.....77½@77½&5%
10 to 14.....77½@77½&7½%
15 to 18.....75&10@75&10&2½%
19 to 26.....75&10&5@80%
27 to 36.....75@75&5%
Tinned:
6 to 14.....77½@77½&7½%
15 to 18.....75&5@75&10%
Annealed, Steel and Tinned, on Spools ..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&5@60&10&5%
Brass, list Feb. 26, '96.....20%
Copper, list Feb. 26, '96.....25%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903.....90&10%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&15@80&17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft..3 ¢
Nos. 4 and 5 Mesh, sq. ft..3½¢
No. 6 Mesh, sq. ft.....3½¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ....75&10@75&10&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern.....70%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....40%
Adjustable S Pipe.....40%
Bemis Pipe.....60%
Briggs Pattern.....40%
Combination Black.....40&5%
Combination Bright.....40%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle .....50&10%
Elgin Wrenches, ₱ doz.....$6.25
Elgin Rethreading Attachment, one die, ₱ doz.....$6.25
Elgin Extra Dies, ₱ doz.....$3.00
Elgin Extra Jaws, ₱ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ₱ doz.....$2.10
Gem Pocket.....50%
Hercules 70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
Improved Pipe (W. & B.).....60%
Solid Handles, P., S. & W....50&10@60
Stillson 65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₱ gross, $7.50; ₱ doz.....$0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ₱ doz.....$48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 .....90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed..70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lbs., $7.75@8.00

For the Table of "Current Metal Prices" see the First Issue of Every Month.